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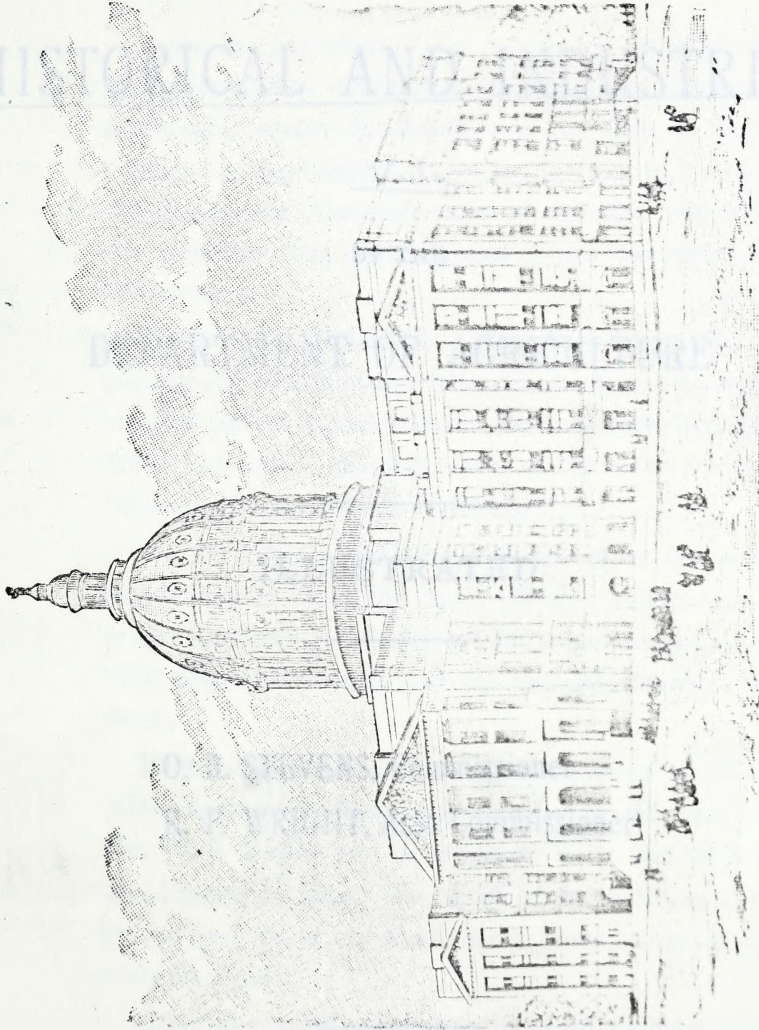
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GEORGIA

HISTORICAL AND MONUMENTAL



STATE CAPITOL, ATLANTA, GA.

ATLANTA, GA.

GEO. W. HARRISON, STATE PRINTER

(THE FRANKLIN PRESS, 1877)

THE UNIVERSITY OF CHICAGO



GEORGIA

PREFACE.

HISTORICAL AND INDUSTRIAL

BY THE

DEPARTMENT OF AGRICULTURE

ILLUSTRATED

O. B. STEVENS, Commissioner

R. F. WRIGHT, Asst. Commissioner

ATLANTA, GA.

GEO. W. HARRISON, STATE PRINTER
(THE FRANKLIN PRINTING AND PUBLISHING CO.)

1901

PREFACE.

Under the provisions of the organic law establishing the Department of Agriculture of the State of Georgia, there was issued a "Hand Book of Georgia," under the direction of Dr. Thos. P. Janes, the first Commissioner of Agriculture; under the direction of his successor, Hon. J. T. Henderson, the "Commonwealth of Georgia" was published; and under his successor, Hon. R. T. Nesbitt, there was issued "Georgia and Her Resources."

The growing demand for information concerning the industrial resources and possibilities of Georgia, as shown by inquiries almost daily received, not only from our own State, but also from every section of the Union, has led to the publication of this work, which we have entitled "Georgia: Historical and Industrial."

We have freely used the publications of our predecessors and are largely indebted also for much valuable information to "White's Historical Collections of Georgia," and other works on our State, including "The Story of Georgia and the Georgia People," by Dr. George G. Smith.

Much information concerning the geology of Georgia has been obtained from the bulletins issued under the direction of the State Geologist, W. S. Yeates, and his assistant, W. S. McCallie, and former assistant, Francis P. King. For much of the article on the geology of Georgia we owe thanks to Prof. S. P. Jones, recently appointed assistant State Geologist.

Other sources of information on which we have relied are the answers to questions sent out by this department to intelligent gentlemen in every county in Georgia, and the United States Census Reports for 1890 and 1900. The information which could not be obtained in time for the body of the work has been published in the appendix at the end of this volume.

Special thanks are due to the Central of Georgia Railway for the loan of many of the cuts with which this work is embellished, and to the Southern Railway for similar favors.

In this connection we take occasion to express our appreciation of the service rendered by Congressman J. M. Griggs, not only to the State of Georgia, but also to all the States of the Union, by his successful effort to secure the enactment of a Federal law, allowing to all the State departments of Agriculture the privilege of sending through the mails all paper-covered agricultural bulletins at one cent a pound, instead of the former rate of half a cent an ounce.

We wish also to express our obligations to Prof. Jos. T. Derry, one of our Georgia historians, for valuable assistance rendered by him in the laborious task of the preparation of this work.

We send forth this volume with the hope that it may prove beneficial to our State, and receive the approbation of those whom we most desire to please—the people of Georgia.

O. B. STEVENS, Commissioner of Agriculture.

R. F. WRIGHT, Assistant.

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ERRATA.

On page 161, in the last line of the first paragraph, instead of "5,000 pounds" read "500 pounds"; and in the next line above "cotton seed" should be "seed cotton."

On page 411, third line from the end of the page for "1840" read "1844."

On page 791, in the middle of the second line of the second paragraph, for "dairy cows" read "dairy farms."

On page 800 in next to the last line in the first paragraph on Quitman county, for "Big Potato creek" read "Pataula creek."



GEN. JAMES EDWARD OGLETHORPE.



TOMICHIHI AND NEPHEW.

GEORGIA:

HISTORICAL AND INDUSTRIAL.

CHAPTER I.

HISTORICAL.

In 1732 a number of benevolent gentlemen of London conceived the idea of founding a home for the poor of Great Britain and a place of refuge for the Salzburgers and other persecuted sects of the continent of Europe. It was to be a model colony, in which both slavery and rum, would be prohibited. It was to be also somewhat of a military colony, a barrier against the hostile encroachments of the Spaniards upon the Province of South Carolina. The charter for its establishment was obtained from George II., king of England, in June, 1732. James Edward Oglethorpe, a gentleman of great benevolence, marked ability and experience in military affairs, being selected by the trustees to take charge of the new colony, set sail from England in November, 1732, with one hundred and sixteen emigrants. After a voyage of nearly two months they arrived in the harbor of Charleston (then known as Charlestown), S. C., where they met a gracious welcome from the Carolinians and their governor, Robert Johnson, who furnished them with provisions, stock, vessels to convey additional supplies to the Savannah river, and a company of soldiers to protect them against the Indians until they could build houses and fortifications.

Leaving his people for a few days at Beaufort. South Carolina, Oglethorpe ascended the Savannah until he came to Yamacraw Bluff, which he selected for his settlement. On February 12th the colonists arrived, and on the 20th was commenced the first house of the new city, which Oglethorpe called Savannah from the name of the river on whose banks it stands. Tomochichi, chief of the Yamacraws, immediately sought an alliance with Oglethorpe, who made a treaty with him, as he did also

with the Creeks, the Muscogeas, and even with the Cherokees of the mountains and the Choctaws on the borders of the Gulf of Mexico. Like William Penn, Oglethorpe purchased from the Indians the title to the lands where he founded his settlements, and so long as he remained in Georgia peace prevailed between the red men and the white.

In March, 1734, the colony was strengthened by the arrival of seventy-eight Salzburgers from Germany. These men, who had been driven from their homes by terrible persecution, found rest and safety higher up the Savannah in Effingham county, at a place which they called Ebenezer, the "Stone of Help"; "for," said they, "the Lord hath delivered us out of the hands of our enemies." Goethe's beautiful poem, "Herman and Dorothea" was founded upon an incident which occurred during the exodus of the Salzburgers.

Oglethorpe was diligent in establishing settlements, locating a Scotch settlement at Darien; a company of immigrants at Frederica, on Saint Simon's Island, and trading posts at Augusta. In February, 1736, among two hundred and twenty-seven immigrants who came over were John and Charles Wesley, afterwards so celebrated as the founders of Methodism. Their purpose was to preach the gospel to the Indians and also to the settlers. Two years later came another celebrated Methodist minister, the Rev. George Whitefield, who resided in the colony several years and founded the Orphan House at Bethesda, a few miles from Savannah.

The Spaniards, who had settled Florida nearly one hundred years before the first permanent English settlement at Jamestown, regarding the settlements in Georgia as an intrusion upon their rights, determined to expel the English. In anticipation of war Oglethorpe went home, and having raised a regiment of six hundred men for the defense of his colony, returned to America and was appointed commander-in-chief of the militia of South Carolina and Georgia. Marching at the head of two thousand men of the two colonies, with friendly Indians included, he invaded Florida, meeting however, with but partial success. Later on the Spaniards invading Georgia with a land and naval force of three thousand men, landed on St. Simon's Island. Oglethorpe, who at this time had barely eight hundred men available, met the Spaniards and inflicted on them so dreadful a defeat that the scene of the conflict has ever since been known as the Bloody Marsh.

So long as Oglethorpe remained in Georgia rum and slavery were prohibited; but in 1743 he returned to England, and four years later restrictions were removed, and Georgia, like all the other English colonies of that day, admitted both slavery and spirituous liquors. That

same year the colony was in great danger from the machinations of a man named Bosomworth, former chaplain of Oglethorpe's regiment, who, having married Mary Musgrove, an Indian claiming to be queen of the Creeks, marched at the head of a large Indian force upon Savannah threatening to exterminate the colonists unless his claims in behalf of his wife were complied with. The undaunted courage of the authorities, who seized the leaders and awed the Indians into submission, saved the colony.

In 1752 the trustees of Georgia surrendered their rights to the crown, and in 1754 John Reynolds was appointed governor. At the close of the French and Indian war in 1763, Spain, who had been the ally of France, ceded to England her possessions of East and West Florida. At this time the boundaries of Georgia, which had embraced a territory between the Savannah and the Altamaha rivers, were extended to the Mississippi on the west and on the south to latitude 31° and the St. Mary's river. Thus Georgia embraced not only the present State, but also the greater part of what we now know as Alabama and Mississippi.

THE REVOLUTION.

Georgia joined with the other colonies in resisting the aggressions of the mother country. On May 11th, 1775, the Savannah powder magazine was taken possession of, and in July a British vessel at Tybee, having 13,000 pounds of powder for the use of British troops, was captured by thirty volunteers under the lead of Commodore Bowen and Colonel Joseph Habersham. Five thousand pounds were sent to the Continental army at Boston, and the rest was stored in the magazine. Another noted exploit was performed near Savannah in March, 1776. Some loyalist planters near Savannah had loaded eleven merchant vessels and prepared for a sea voyage. Some British war vessels, for the purpose of assisting these tories, moved up the river and threatened Savannah. But the Georgians under Colonel McIntosh, aided by the Carolinians under Colonel Bull, burned three of these merchant vessels and rendered six unfit for service.

In April, 1776, Georgia instructed her delegates in Congress to vote for independence, which, on July 4th of the same year, was declared by the unanimous vote of all the delegates of the thirteen colonies in Congress assembled. The signers of the declaration on the part of Georgia were Button Gwinnett, Lyman Hall and George Walton. For two years Georgia escaped serious invasion, but in December, 1778, Savannah was captured, and Augusta soon after. The defeat of the Tories at Kettle creek by the Carolinians under Pickens, and the Georgians

under John Dooley and Elijah Clarke, resulted in the recapture of Augusta by the Americans, who, notwithstanding the defeat of Ashe at Brier Creek and the repulse of the allied French and American armies before Savannah, continued to hold all upper Georgia until after the fall of Charleston in 1780. While the allied armies were before Savannah, Colonel John White of the Georgia Continentals, by a skillful stratagem, captured five British vessels, one hundred and thirty stands of arms and one hundred and eleven British soldiers. Although after the fall of Charleston South Carolina and Georgia were both overrun, the patriot bands of those two States under their favorite leaders continued the struggle. The Georgians shared in the victories of King's Mountain and Cowpens, and Colonel Elijah Clarke, the Marion of Georgia, after failing in one attempt to capture Augusta, in the next year began another siege of that post, which was made successful by the arrival of General Pickens of South Carolina, and "Light Horse Harry" Lee of Virginia, with a considerable force. Almost the last fight of the Revolution was Wayne's victory over the Indian allies of the British near Savannah on the night of June 23d, 1782, a little over eight months after the surrender of Cornwallis at Yorktown. On the 11th of July, 1782, Savannah was evacuated by the British and the authority of Georgia was established over all her borders.

On the 2d of January, 1788, the Constitution of the United States was ratified by a convention of delegates from the different counties of Georgia, assembled at Augusta. The following is a list of the delegates of the ratifying convention:

John Wereat, President, and delegate from the county of Richmond

William Stephens, Joseph Habersham, Chatham county.

Jenkin Davis, N. Brownson, Effingham county.

Edward Telfair, H. Todd, Burke county.

William Few, James McNeil, Richmond county.

George Matthews, Florence Sullivan, John King, Wilkes county.

James Powell, John Elliott, James Maxwell, Liberty county.

George Handley, Christopher Hillary, J. Milton, Glynn county.

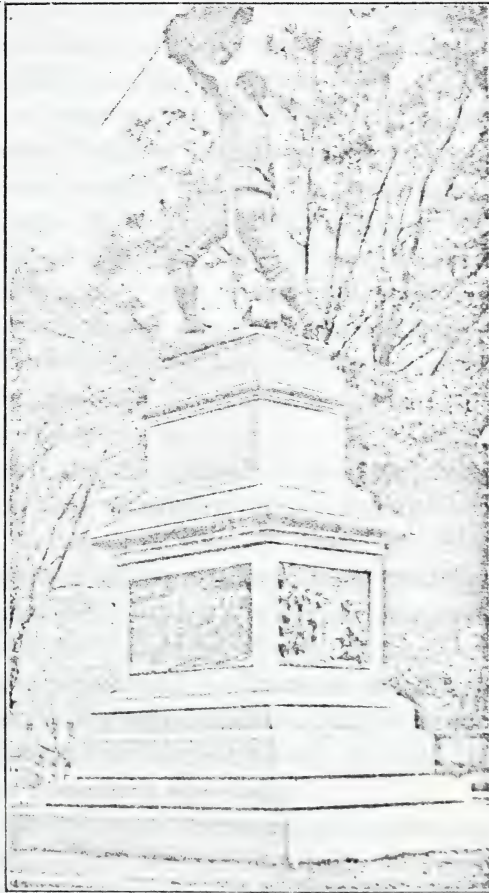
Henry Osborne, James Seagrove, Jacob Weed, Camden county.

Jared Irwin, John Rutherford, Washington county.

Robert Christmas, Thomas Daniell, R. Middleton, Greene county.

UNDER THE CONSTITUTION, 1788 TO 1860.

Under the government established by the Federal Constitution, Georgia increased rapidly in population and wealth. Settlers poured into the State from North Carolina, Virginia and States farther north. Of



JASPER MONUMENT, SAVANNAH, GA.

these the Virginians were so numerous that the Indians, who still occupied many of the fairest portions of the State, frequently spoke of the Georgians as Virginians.

One of the most important events in the history of Georgia is the invention of the cotton gin by Eli Whitney, in 1794. Prior to that time the separation of the seed from the lint was so difficult as to limit the cultivation of cotton. This had to be done by hand, a task being four pounds of lint cotton per week for each head of a family, working at night, in addition to the usual field work. At this rate it would take one person two years to turn out the quantity of cotton contained in one average standard bale, or 500 pounds. One gin, in proportion to its power and saw capacity, will gin out from three to fifteen 500-pound bales in one day. At the time of this important invention Mr. Whitney was the guest of his aunt, the widow of General Nathaniel Greene. Probably no invention ever caused such rapid development of the industry with which it was associated. In 1793 the exportation of cotton from the United States was 487,500 pounds, or 975 bales, estimated at 500 pounds to the bale. In 1900 the production in the United States was 9,345,391 bales.

The Yazoo Land Act, passed by the legislature of 1795, conveying to four associations thirty-five million acres of land lying between the Mississippi, Tennessee, Coosa, Alabama and Mobile rivers, for five hundred thousand dollars, produced great excitement throughout Georgia. Though a bill ratifying the sale of these lands passed both houses of Congress, a subsequent legislature, under the influence of General James Jackson, repudiated the Yazoo act and committed the records of it to the flames, at the same time ordering the purchase money to be refunded to whomsoever it might belong. Twenty years, however, elapsed before a final settlement was reached.

In 1802 Georgia ceded to the Federal government all her lands west of the Chattahoochee, embracing nearly one hundred thousand square miles of territory, the greater part of the present States of Alabama and Mississippi. Thus Georgia, like Virginia, is a "Mother of States."

The purchase from France by the United States, in 1803, of the vast Louisiana territory was of great benefit to Georgia. That territory had for a long time been under the dominion of Spain, whose agents frequently incited the Indians of the western border to hostile acts. Being no longer subject to these annoyances, new counties were laid off and towns and villages sprang up in the wilderness. In 1807 the new town of Milledgeville became the seat of government.

During the second war with Great Britain, 1812-15, the Indians of

Alabama perpetrated horrible massacres. The Georgians under General John Floyd, and the Tennesseans under General Coffee, with Major-General Andrew Jackson of Tennessee as commander-in-chief, defeated the Indians in battle after battle. The power of the savages was finally crushed by the great battle of Tohopeka, or the "Horse-shoe Bend" in Alabama, and the Indians sued for peace.

The first steamship that ever crossed the Atlantic Ocean, though built in New York, was owned in Savannah, and from that port started on its voyage to Liverpool in 1819. It was named "Savannah."

When, in 1821, Florida was ceded by Spain to the United States and thus passed forever from the hands of the ancient enemy of Georgia, great was the rejoicing throughout the State.

When Georgia ceded her western lands the United States agreed to extinguish the Indian title to the same. This was not done rapidly enough to suit the Georgians and a controversy arose between the State and the Federal government, during which Governor Troup proclaimed the most ultra State rights doctrine, and defied President John Quincy Adams. Georgia triumphed in the controversy, and when Andrew Jackson became president he did all in his power to promote the wishes of the Georgians, with the result that all the Indians east of the Mississippi were finally transferred to the Indian Territory, west of the great river.

In the Mexican War (May 8, 1846 to May 30, 1848), Georgia's sons promptly answered the call to arms, and faithfully discharged the duties assigned them. Among the most distinguished of the officers in the regular army of the United States were sons of Georgia, of whom Colonel James S. McIntosh was killed at Molino del Rey, and W. H. T. Walker desperately wounded at the storming of Chapultepec.

THE WAR BETWEEN THE STATES.

In the lamentable conflict of arms between the Northern and Southern States of the Union (1861-1865), Georgia bore a prominent part. This war was the outgrowth of a long struggle for the balance of power between the commercial and manufacturing States on the one side, and the purely agricultural States on the other, in combination with opposing theories as to the real nature of our Federal Union. This struggle became manifest in 1820 on the application of Missouri for admission into the Union with a Constitution allowing slavery, an institution which differentiated the opposing groups of States. The opposition to the admission of Missouri was not based on moral grounds, but on the

idea that it gave to the South a preponderance of influence. By the Missouri compromise the dangerous dispute was settled for a time; but the acquisition of new territory from Mexico in 1848 reopened the old quarrel, and slavery, now opposed by some on moral grounds but by the great majority for reasons purely political, became the occasion of the most stupendous conflict of modern times.

In this fierce struggle, for which Georgia furnished ninety-four regiments and thirtysix battalions, embracing every arm of the service, the blood of her sons was freely poured out on every battlefield from Pennsylvania to the Mississippi, and from the Ohio to the Gulf, and (if we include the thousands who had emigrated to the States west of the "Father of Waters"), in every important combat throughout the bounds of the Trans-Mississippi department of the Southern Confederacy. On Georgia's soil were fought the great battles of Chickamauga, Resaca, New Hope Church (a series of engagements from May 25th to June 4th), Kennesaw Mountain, Peachtree Creek, two fierce battles at Atlanta (July 22 and 28), Jonesboro, and numerous smaller engagements and skirmishes. Sherman's march to the sea, when almost the entire military force of the State was absent in Virginia or Tennessee, scattered ruthless destruction all along its path, and the final disastrous close of the long continued war wrecked the hopes and fortunes of her people.

AFTER THE WAR.

But the brave men, who with constantly diminishing strength and exhausted means had maintained so heroic a struggle against overwhelming numbers and boundless resources, lost no time in idle repining, but with the energy, pluck and perseverance characteristic of the Anglo-American, wrought out by the blessing of God the redemption of their State. During the dark days of reconstruction they did not yield in base submission to oppression and wrong, but maintaining their rights in every legitimate way, shared at length in the final triumph of the whole South in the courts and Congress of the nation. From the undaunted energy and pluck of the Old South sprang the New South, with its rapid development along all lines.

While Georgia is yet poor compared with States not injured by the war, she stands in the front rank of those that did suffer, and in the ratio of progress compares favorably with those of the North which even prospered during all the years of strife, oppression and wrong.

THE WOMEN OF THE SOUTH.

During the tremendous conflict that shook this continent, the women of the South exhibited a heroism and devotion to principle scarcely equalled and never surpassed since time began. With aching hearts they bade their loved ones good-bye, and through tearful eyes gave them a smile of hope, speaking at the same time brave words that nerved the warrior's soul to deeds of daring unparalleled in the records of this world. With undaunted spirit they bore privations, perils and heart-rending bereavements, and when, after the final catastrophe the survivors returned downcast and almost despairing, it was faithful woman's smile that bade them hope again and stirred them to that high endeavor, which, amid the most appalling surroundings, brought forth the New South from the ashes of the Old, redeeming by the help of God their beloved States from oppression and ruin, and starting them again upon the road to prosperity and power. Even before the débris of our shattered fortunes had been cleared away, noble women turned their attention to the preservation of the memory of the heroic deeds that wreathed the Southland's brow with Fame's unfading chaplet, and mid their poverty began the erection of monuments to the illustrious dead, gathered the scattered remains of heroes from many a battle-field, marked their last resting places with headstones, and organized into societies whose chief object is to keep alive the remembrance of the heroic deeds of the South's heroic men, whether living or dead.

THE SLAVES DURING THE WAR.

Nor should we forget that humble class whose ancestors were brought from their African homes in Dutch, British and New England ships and sold to the white men who, by the aid of the stalwart muscle of the sons of Africa, cleared the wilderness and prepared the way for thriving farms, great plantations and growing cities. Though the legislatures of some Southern colonies endeavored to prevent the importation of these Africans, the British government set their acts aside in the interest of English and New England traders. Even after the establishment of American independence the traders of New England, who had been among the first to engage in the African slave trade, continued it to the year 1808, when the traffic was abolished by Congressional enactment. These same New England traders, previous to that date, often violated the laws of such Southern States as had prohibited the traffic by smuggling slaves into out-of-the-way places and selling them to those who were ready to purchase. Thus the South became so stocked with



GEORGIA CONFEDERATE MONUMENT AT CHICKAMAUGA PARK.

TO THE LASTING MEMORY OF HER SONS

Who fought on this field—
Those who fought and lived, and those who fought and died;
Those who gave much and those who gave all—

Georgia
ERECTS THIS MONUMENT.

negroes that the Southern people considered emancipation under any condition too dangerous an experiment to be even thought of.

Yet, such were the kindly relations that for the most part existed between masters and slaves, that even after the war had become on the part of the North a struggle for emancipation as well as for union, the negroes remained in peace on the plantations, made the crops that supported the armies in the field and their families at home, and with a fidelity that amazed the enemies and slanderers of the South protected the wives and children of the men who, far from their defenseless loved ones, stood upon the firing-line striving with steadily diminishing numbers to keep back the ever increasing hosts gathered from the fields and crowded cities of the North and of Europe. Many faithful slaves went with their masters to the tented field, cooked and did other service for them, nursed them when sick, and, if they died in battle or hospital, wept over them, and returned with the lifeless bodies to lay them beside kindred dead in the family burial ground.

The tender care shown for them by kind masters and mistresses in sickness and old age, the pious instructions of godly women and devoted missionaries, among which latter class some in malarial districts (harmless to the negro but dangerous to the white man), laid down their lives for the salvation of the slave, created in the bosom of the negro a devotion and loyalty which even the results of the war and the teachings of fanatics have not been able to efface from the minds and hearts of the great majority of the older members of the race. Acts of violence such as have in recent years disgraced so many of the younger generation of negroes were unknown before the war, or even when the mighty armies of invaders were thundering at our gates. The estrangement between the races and the outcroppings of violence in some quarters are due to the teaching of those who have endeavored to preach a political and even social equality that will never be allowed.

The majority of our colored population are still contentedly toiling in the fields, helping to increase the wealth of the State, and acquiring property themselves, in which they have the encouragement and aid of their white neighbors. There are no agricultural laborers so well suited to large sections of our State as are the majority of our negro population.

THE SPANISH-AMERICAN WAR AND THE WAR IN THE PHILIPPINES.

In the restoration of good will between the States of the Union, the sons of Georgia have been conspicuous, and when the United States be-

came involved in war with Spain, Georgia furnished according to population more volunteers than any other State of the Union. General Joseph Wheeler, a son of Georgia and adopted son of Alabama, nobly illustrated those States at Santiago, and many gallant young Georgia officers of the regular army and navy of the United States, both in Cuba and in the Philippines, proved that the Confederate blood in their veins did not diminish, but rather increased their devotion to the flag of the restored Union. Georgia furnished three regiments for the Spanish-American war, and a fourth one, "Ray's Immunes," was made up almost entirely of Georgians. The twenty-ninth regiment of the United States Volunteers in the Philippines consisted almost entirely of Georgians.

GOVERNORS OF GEORGIA.

The governors of Georgia, from its first settlement in 1733 to the present time (1900), are as follows:

Under the Trustees.

James Edward Oglethorpe, July 15th, 1732, to July 11, 1743.

William Stephens, acting in absence of Oglethorpe, from July 11, 1743, to April 8, 1751.

Henry Parker, Acting Governor from April 8, 1751, to October 1, 1754.

Under the Crown.

John Reynolds, from October 1, 1754, to February 15, 1757.

Henry Ellis, from February 16, 1757, to October 31, 1760.

James Wright, from October 31, 1760, to July 11, 1782.

James Habersham, President of Council and Acting Governor from July 2, 1771, to February 11, 1773.

Under the American Government.

William Ewen, President of Council of Safety from June 22, 1775, to January 20, 1776.

Archibald Bulloch, President of the Provincial Council and Commander-in-Chief from January 20, 1776, to February 22, 1777.

Button Gwinnett, with same title as last, to May 8, 1777.

Governors Under the New Constitution of Georgia of 1777.

John Adam Treutlen, from May 8, 1777, to January 8, 1778.

John Houston, from January 8, 1778, to December 29, 1778.

John Wereat, President of Executive Council and Acting Governor from December 29, 1778, to November 4, 1779.

George Walton, from November 4, 1779, to January 7, 1780.

Richard Howley, from January 7, 1780, to January 7, 1781.

Stephen Heard, President of Executive council and Acting Governor from January 7, 1781, to August 15, 1781.

Nathan Brownson, from August 16, 1781, to January 8, 1782.

John Martin, from January 8, 1782, to January 9, 1783.

Lyman Hall, from January 9, 1783, to January 9, 1784.

John Houston, from January 9, 1784, to January 14, 1785.

Samuel Elbert, from January 14, 1785, to January 9, 1786.

Edward Telfair, from January 9, 1786, to January 9, 1787.

George Matthews, from January 9, 1787, to January 25, 1788.

George Handley, from January 25, 1788, to January 9, 1789.

George Walton, from January 9, 1789, to November 9, 1790.

Edward Telfair, from November 9, 1790, to November 7, 1793.

George Matthews, from November 7, 1793, to January, 15, 1796.

Jared Irwin, from January 17, 1796, to January 11, 1798.

James Jackson, from January 12, 1798, to March 3, 1801, being the first governor under the Constitution of 1798.

Under the State Constitution of 1798.

After James Jackson, David Emanuel, President of Senate and Acting Governor from March 3, 1801, to November 7, 1801.

Josiah Tatnall, from November 7, 1801, to November 4, 1802.

John Milledge, from November 4, 1802, to September 23, 1806.

Jared Irwin, President of the Senate and Acting Governor from September 23, 1806, to November 7, 1806.

Jared Irwin, Governor from November 7, 1806, to November 9, 1809.

David B. Mitchell, from November 9, 1809, to November 9, 1813.

Peter Early, from November 9, 1813, to November 9, 1815.

David B. Mitchell, from November 9, 1815, to March 4, 1817 (resigned).

William Rabun, President of Senate and Acting Governor until November, 1817, from which time he was governor until October 25, 1819, when he died.

Matthew Talbot, President of Senate and Acting Governor until November 13, 1819.

John Clark, Governor from November, 1819, to November, 1823.

George M. Troup, Governor from November, 1823, to November, 1827.

John Forsyth, from November, 1827, to November, 1829.

George R. Gilmer, from November, 1829, to November, 1831.

Wilson Lumpkin, from November, 1831, to November, 1835.

William Schley, from November, 1835, to November, 1837.

George R. Gilmer, from November, 1837, to November, 1839.

Charles J. McDonald, from November, 1839, to November, 1843.

George W. Crawford, from November, 1843, to November, 1847.

George W. Town, from November, 1847, to November, 1851.

Howell Cobb, from November, 1851, to November, 1853.

Herschel V. Johnson, from November, 1853, to November, 1857.

Joseph E. Brown, from November, 1857, to July, 1865.

James Johnson, Provisional Governor (appointed by President Andrew Johnson), from July, 1865, to December, 1865, until an election could be held by the people.

Charles J. Jenkins, Governor from December, 1865, to January, 1868, when he was deposed by General Meade, acting under the reconstruction measures of Congress, and Brigadier-General Thomas H. Ruger of the United States army, was appointed to act as military governor until July, 1868, at which time Rufus B. Bullock, elected under the reconstruction measures, became Governor.

Under the Constitution of 1868.

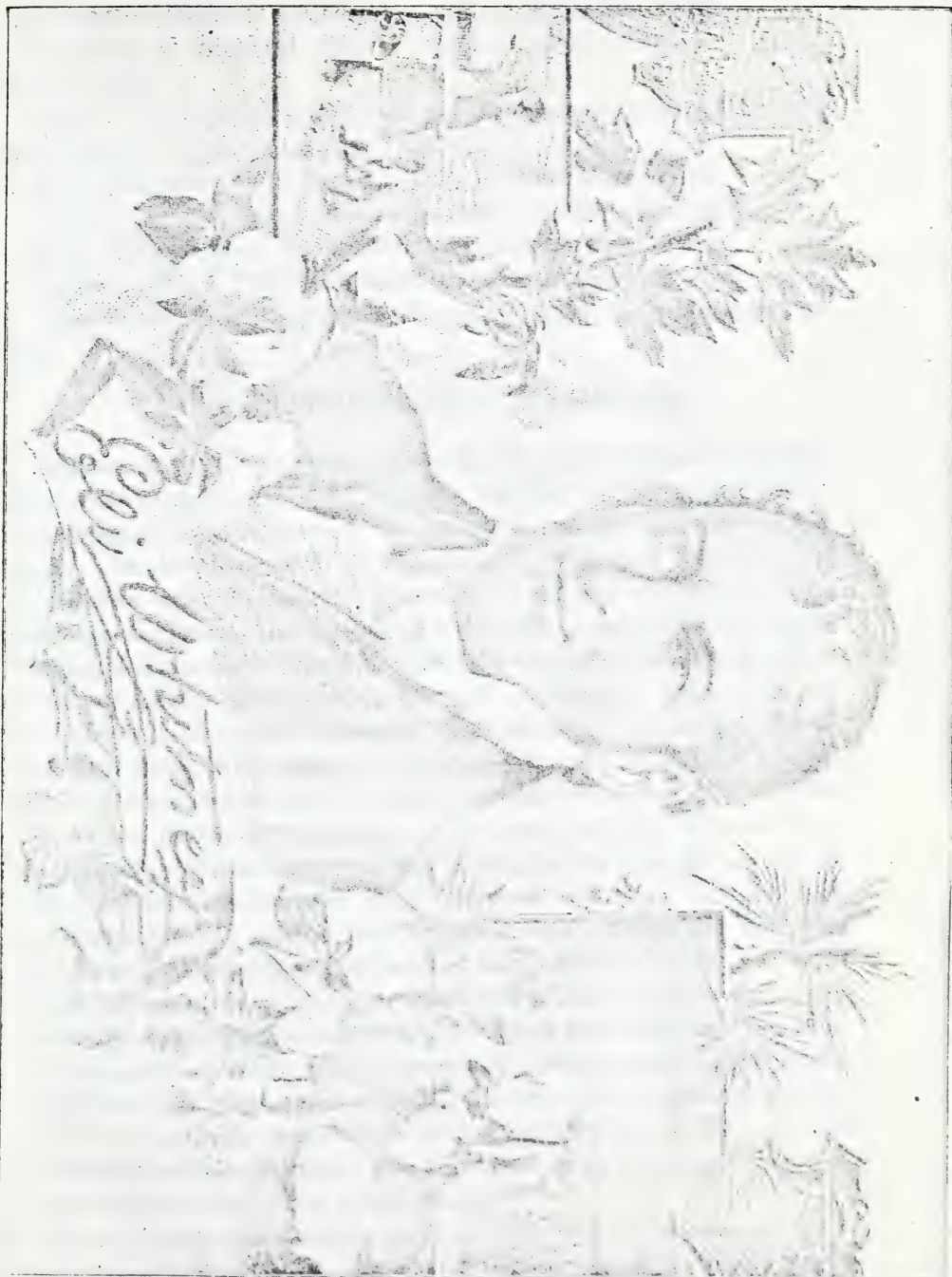
Rufus B. Bullock, Governor from July, 1868, to October 30, 1871, when he resigned his office.

Benjamin Conley, President of Senate and Acting Governor from October 30, 1871, to January 12, 1872.

James M. Smith, Governor from January 12, 1872, to January 12, 1877.

When Governor Jenkins was deposed, he took with him the Great Seal of Georgia, refusing to give it up, but after the inauguration of Governor Smith he turned the Seal over to him as the first governor elected by the untrammelled voice of the people since 1868. On that occasion he received the thanks of the legislature, and a handsome medal was voted to him for his fidelity to the interests and honor of Georgia. This event deserves to rank with the Charter Oak incident of colonial days in Connecticut.

General Alfred H. Colquitt, Governor from January 12, 1877, to November, 1882, beginning under the Constitution of 1868 and ending under that of 1877.



By Permission, from Moore's "Augusta and Richmond County."

Under Constitution of 1877.

Alfred H. Colquitt's second term, ending November, 1882.

Alexander H. Stephens, from November, 1882, to March 4, 1883, when he died.

James L. Boynton, President of the Senate and Acting Governor from March 5, 1883, to May 10, 1883.

H. D. McDaniel, from May 10, 1883, to November, 1886.

John B. Gordon, from November, 1886, to November, 1890.

W. J. Northen, from November, 1890, to November, 1894.

W. Y. Atkinson, from November, 1894, to November, 1898.

Allen D. Candler, inaugurated November, 1898, the present incumbent.

INDUSTRIAL PROGRESS OF GEORGIA.

Scarcely had the war ended before the Georgians set to work to rebuild their ruined homes and fortunes. The city of Atlanta afforded at that time a striking evidence of the marvelous pluck and energy of the people. In the spring of 1865, even before the close of hostilities, the old citizens began to return, and Atlanta springing phoenix-like from her ashes was already starting anew on the road to prosperity and wealth with an impetus which even the succeeding days of force and oppression could not check. This city is a fair type of Georgia, whose cities and towns have steadily grown, some of them showing a surprising ratio of increase. Even little villages have a neater, more substantial appearance, and beautiful country dwellings are more numerous than ever before in the history of our State. Our manufacturing interests have made steady and active progress, and within the last year the number of cotton factories has increased at an unprecedented rate. Old and long established lines of railroad have increased their mileage and new ones have been constructed, so that most of our farmers of to-day are within easy distance of the road over which the products of their farms can be transported. Electric cars give rapid transit from suburban homes to the hearts of our cities, and telephones of both short and long distance supplement the telegraph in affording instantaneous communication for business or pleasure. Agriculture has been greatly improved; up-to-date methods have been adopted; two blades of grass have been made to grow where one did a few years ago..

Just after the war the high price of cotton led the planters of Georgia to devote all their energies to the production of the fleecy staple, and then by its subsequent rapid decline brought disappointment and

threatened ruin. Taking the alarm the farmers began more and more to raise their own supplies. Thus they are making the farm what it should be, a little world of its own, whose master living independently on the heavy interest paid into his coffers by his well-tilled soil, can become a prince among men, and not, what a borrower must ever be, a servant to the lender. The improvement in the planting interest of Georgia is largely due to the Agricultural Department, established in 1874. Dr. Thomas P. Janes, its first commissioner, made this department a mighty agency for good. The noble work was continued by his able successor, John F. Henderson and his zealous assistant, R. J. Redding (now director of the Georgia Experiment Station and president of the Georgia Dairyman's Association); next by Commissioner R. T. Nesbitt, a faithful and diligent promoter of the people's welfare; and is now being carried forward by the present incumbent, Commissioner O. B. Stevens, and his assistant, Mr. Robert F. Wright, who are determined not to be excelled by their illustrious predecessors. One of the chief objects of this department is the inspection and analysis of fertilizers and oils, the profit of which, over and above all expenses, is about \$30,000 annually, set apart for the benefit of the school fund. Thus this department instead of being an expense is a source of revenue to the State, though it was not originally so intended, and ought not so to be, for every dollar collected could be spent much more to the advantage of the State by being used for the legitimate purposes of this important branch of the government. Other objects are the encouragement of agriculture in all its branches, the promotion of dairying and creameries, the raising of the best breeds of cattle for the farm and the market, and the eradication of that pest commonly known as the cow-tick (*boophilus bovis*). The department has succeeded in lowering the line of quarantine against the tick so as to exempt some of the North Georgia counties from its operation as to them, and is earnestly seeking the co-operation of the people in completely rooting out this plague, so injurious to the cattle interests of the State.

One of the great benefits of this department to the planters was seen in the fall of 1899. When the great statistician Neil predicted a cotton crop of twelve and a half million bales, and consequently low prices, word went forth from the Agricultural Department that it was advisable for all farmers who could do so, to hold their cotton, as there would probably be only nine and a half millions of bales with a probable rise in the price. The advice was justified by the result.

The State Chemist, John M. McCandless, and his assistants, R. G. Williams and J. Q. Burton, in addition to the other important labors of



their department, are doing faithful and efficient work in protecting the farmers against spurious fertilizers and dangerous oils.

The State Entomologist, W. M. Scott, has won the favor of the fruit growers of Georgia by his zealous labors in their behalf, and, especially, by his unceasing efforts for the extirpation of all the pests that attack the orchards.

The Geological Bureau under the management of the State Geologist, W. S. Yeates, and his assistants, S. W. McCallie and Dr. T. L. Watson, is doing a great work for Georgia, by promoting the development of its minerals, metals, building stones, clays and artesian wells.

In everything that should characterize an enlightened Christian State Georgia stands among the foremost in our Union. Leaving behind the past she is pressing forward to a future of increased prosperity and greatness. One strong evidence of growth in a State is increase in population. By the census of 1890 the population of Georgia was 1,837,353. By that of 1900 it is 2,216,331. This is an increase of 378,978, or within a very small fraction of 21 per cent.

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CHAPTER II.

GENERAL DESCRIPTIVE SKETCH.

Georgia, the greatest in area of any State east of the Mississippi river, embraces 59,475 square miles, being larger by 1,274 square miles than England and Wales combined, and nearly equal in size to all New England. On its northern border are North Carolina and Tennessee, on the northeastern side South Carolina, on the east the Atlantic Ocean, on the south Florida, and on the west Alabama. Containing in its greatest length from north to south 320 miles, and nearly four and one half degrees of latitude, it has great variety of soil, climate and productions. Its northern portions are diversified by mountain, hill and vale, and drained by numerous rivers, some of which are navigable. The sides of the hills and mountains are covered with the various hard woods, interspersed with pine, a lighter wood, which furnishes an excellent resinous kindling for fires. The soil of this mountain region varies from dark to a red or mulatto color, and is very productive. The valleys and river bottoms are covered in their proper seasons with abundant crops of wheat, corn and other cereals, and are dotted with substantial farm-houses located near some bubbling spring of pure, cold water, from which runs a rippling streamlet through the farm, affording to the stock abundance of healthful drink at all seasons of the year. In some portions of this section cotton is successfully raised, and occasionally thriving fields of tobacco may be seen.

The surface of Northeast Georgia varies from 1,000 to 5,000 feet above the level of the sea. This section is traversed by that part of the Appalachian chain known as the Blue Ridge, with an altitude above sea level of from 3,000 to 5,000 feet. This range runs about one third the distance across the State, and terminates abruptly. Northwest Georgia, the Limestone Region, with an altitude ranging from 600 or 700 to 2,500 feet, covers the greater part of ten counties, with an extent of 3,600 square miles. Of Northern Georgia about 6,000 square miles are above the altitude of 1,000 feet.

About twenty miles west of the Blue Ridge lies the Cohutta Range, a continuation of the Unaka of Tennessee, having an altitude of 3,000 feet, with an abrupt escarpment toward the valley of the Oostanaula on



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LEGEND

- Red & Brown Loams-Limestones & Calcareous Shales.
- Red Clay Lands.
- Hardwoods.
- Savannahs and Palmetto Flats.
- Gray, Sandy or Gravelly Lands.
- Sandy Lands-Sandstones and Arenaceous Shales.
- Flatwoods.
- Hard Argillaceous Shales.
- Gray Gravelly Lands.
- Cherty, Magnesian Limestones.

Upper limit of Low-Land Rice, corresponding approximately with that of Palmetto Flats.

Northern limit of Wire-Grass, corresponding approximately with southern limit of the Wheat crop.

Present approximate Northern limit of Sugar Cane.

Upper limit of Cotton Culture, corresponding with Lower Limit of White Pine and Spruce.

AGRICULTURAL MAP

GEORGIA.

SHOWING SOILS AND THE CLIMATICAL RANGE OF CERTAIN INDIGENOUS AND CULTIVATED PRODUCTS.

DEPARTMENT OF AGRICULTURE.

Franklin Prtg. & Pub. Co.,
Atlanta, Ga.

SCALE 100 MILES

the west, and continuing into Alabama in a low elevation known as Dugover Mountain. To the northwest come Lookout and Sand Mountain ranges, which, with their table-lands, belong to the Alleghany system. The highest point of Lookout, known as High Point, has an elevation of 2,408 feet. A northeastern spur of Lookout is known as Pigeon Mountain, with an elevation of from 1,800 to 2,000 feet above the sea, but with one point rising to 2,331 feet. Along the top of this mountain runs the boundary line between Walker and Dade counties. Round Mountain, also a spur of Lookout, has an elevation of over 2,200 feet. From this point rises Rock Creek, flowing longitudinally along the surface of the mountain adjacent to a beautiful waterfall known as Lula, all of which, with Lula Lake, make one of the most picturesque scenes in Georgia. Taylor's Ridge with its extension, the White Oak Mountains, traversing parts of Catoosa, Whitfield and Chattooga counties, rises to 1,300 and 1,500 feet above the sea, Rocky Face Ridge, rising to an elevation of from 1,500 to 1,700 feet, crosses the western part of Whitfield county, forming the eastern watershed of East Chickamauga creek, which flows through the valley at an elevation of 900 feet above the sea.

Among the interesting features of Northwest Georgia are numerous caves. One of the largest, of great extent, with far-reaching galleries, is Hardin's cave, about three miles southeast of Kingston. Some of the chambers are twenty to twenty-five feet high, and, owing to the sloping roof, the cave appears even higher. At Crawfish Springs, near Chickamauga, a stream sufficiently large to be used as a water-power, issues from an underground cavern, and has been converted into a beautiful lake and waterfall. Many other caverns, some extensive, occur at the bases of Lookout, Pigeon and Sand Mountains.. Near the beautiful little town of Cave Spring extensive caverns are found in the limestone formations.

The mountain section of Georgia is noted for its charming valleys. Cedar, Texas, Broomtown and Vann's valleys, are among the most noted in Northwest Georgia, while the fame of Nacoochee, in the northeast section among the mountains of White county, has been proclaimed in song and story. Nacoochee, or the "Evening Star," so the story goes, was the beautiful daughter of a noted Cherokee chief. She was wooed and won by Santee, a brave young warrior of the Choctaw nation, a people who were the bitter foes of the Cherokees. One dark night Nacoochee eloped with her lover. The enraged father, at the head of a hundred warriors, after days and nights of ceaseless search, found the lovers in their hiding-place among the rocky fastnesses of Mount Yonah. Santee

was condemned by the old chief to be thrown from the highest precipice of the mountain, and the sentence was put into immediate execution; but to her father's horror the maiden leaping over the precipice shared her lover's fate. Nacoochee and Sautee were buried on the banks of the Chattahoochee in one grave, and a mound raised over them to mark the spot. Two adjoining valleys now bear the names of the young Cherokee girl and her Choctaw lover. In Habersham county are found the falls of Toccoa and in Rabun county the grand chasms and cataracts of Tallulah, famed far beyond the limits of Georgia. Toccoa creek falls 185 feet perpendicularly over a ledge of sandstone. Of the beauty of this silvery cascade descending so gently from the lofty rock, whose sides are plainly seen behind the watery veil, no pen can give an adequate description. Toccoa the Beautiful! Never was name more worthily bestowed. The Tallulah river is the western branch of the Tugaloo, one of the sources of the Savannah. Ten miles above the junction of the Tallulah with the Chattooga, the Falls of Tallulah, by four perpendicular pitches of water of from fifty to eighty feet and a great many smaller cataracts, plunge downward into a grand chasm 860 feet deep. The four principal falls are *L' eau d'or*, *Tempesta*, *Hurricane* and *Oceana*.

All Northern Georgia abounds in useful minerals. Coal is found in the extreme northwest in Dade and Walker counties, the various iron ores in Dade, Walker, Chattooga, Floyd and Polk. In the State some lead, silver and copper are found, the latter being an extension of the celebrated Ducktown region of Tennessee, varieties of it being found in the counties of Union, Towns, Cherokee, Paulding, Haralson, Carroll, Murray, Fulton, Lincoln and Greene. Ochre and sulphate of baryta exist in large beds. Other minerals that have been successfully mined are pyrites, mica, talc, slate, tripoli, limestone and infusorial earth.

Dahlonega, in Lumpkin county, is the center of gold operations in Georgia, the richest veins being in Lumpkin and White. Other counties in which gold is found are Rabun, Towns, Habersham, Hall, Union, Gwinnett, Forsyth, Dawson, Milton, Cherokee, Bartow, Paulding, Douglas, Carroll, Haralson, Gilmer, Fannin, Lincoln, and McDuffie. It is found in small quantities in Fulton.

The bauxite deposits are the largest in the United States. This is the basis of aluminum. Deposits of commercial value have been found in Walker, Chattooga, Bartow and Floyd.

Corundum is found in Georgia in all its varieties except emery. Slate is successfully quarried at Rockmart by the Georgia Slate Company. The manganese deposits are very rich. Sandstones of a variety of colors

and adapted to a variety of purposes are found in Northwest Georgia. In the northern counties asbestos is also found.

Georgia to-day stands second only to Vermont as a marble State, being noted throughout the United States for the excellent quality of her marble.

In 1893 the value of the output was in round numbers \$273,000, and almost the entire product was at that time supplied by the Georgia Marble Company, whose headquarters and quarries were near Tate, in Pickens county. The quarries here opened are named respectively, Creole No. 1, Creole No. 2, Cherokee, Etowah and Kennesaw. The Piedmont quarry, also in Pickens county, is very extensive. The increase from all these quarries had, in 1894, brought the entire product up to 481,529 cubic feet, valued at \$716,359, an increase in one year of over 174 per cent. The structure of the marble from the different quarries is essentially the same, the only marked difference being in color. Some of it is white, some bluish-gray with dark-blue spots, some with dark-blue mottlings, useful for monumental work and interior decorations, others with a variety of shades, such as pink, salmon, rose and dark green, producing rich effects, specially adapted for wainscoting, panels, counters, table-tops, etc. The deposits are larger than any other in the United States. The companies operating the quarries are prepared to saw and finish the stone, and this is done by them and also by other large companies established for this work at Nelson, Canton, and near Marietta. Thus almost the entire product of the Georgia quarries is put upon the market in a finished condition. Marble is quarried also in Cherokee, Whitfield and Polk. Beautiful marble is found also in Floyd.

Fifteen years ago Georgia marble was little known beyond the limits of the State. Now it is the most famous in America, and is recognized as the best for building purposes. The demand for it extends throughout the United States, and shipments have been made to Hawaii. From the Southern Marble Company at Marble Hill was shipped the largest block of marble ever quarried in the United State, to go into the capitol of Minnesota. In the construction of Mississippi's new capitol Georgia marble is one of the main materials, as it is also in the new capitol of Rhode Island.

Granite of the best grade abounds in Georgia. The largest known deposit of this useful stone in the world is found in DeKalb county, fourteen miles east of the city of Atlanta. In the midst of a vast bed of stone extending in all directions, from a comparatively level country there rises to the height of 1,686 feet a solid mountain of granite, with-

out soil except in a few scattered places, where a little verdure appears. This "geological monstrosity," as Dr. Alexander Means, an eminent scientist of the State in his day, styled it, is known by the appropriate name of Stone Mountain. It is seven miles in circumference at the base, and by the ordinary ascent one mile from base to apex. The stone of this mountain and of the wide extended bed of granite that spreads out from its base is uniform in character, admirably adapted for paving as well as for building and monumental work, and is being used for these purposes not only in the cities of Georgia, but also in those of the East and West. There are many other extensive deposits through the State, notably those in Coweta, Elbert, Oglethorpe, Walton, Hancock, Spalding, Fayette and Carroll counties. In 1880 the entire granite product of the State for paving material was valued at \$13,000, and the entire industry employed only thirteen hands. In 1896 the product in paving material alone was worth more than \$750,000, and gave employment to one thousand hands.

Gneiss is quarried extensively in Carroll, Coweta, Meriwether and Heard counties. Red sandstone is quarried near Graysville, in Catoosa county.

The granite beds are found in what is known as Middle Georgia. This is the most thickly settled section of the State. The line dividing it from South Georgia may be considered as running directly across the State from Augusta to Columbus and passing at the head of navigation near Milledgeville and Macon. Much of the land is exceedingly fertile, producing abundant crops of cotton and of corn, or any of the grains that can be raised in any part of the United States. The various grasses, too, afford abundant pasturage for horses and cattle. The creek and river bottoms are exceedingly fertile, but, as they are liable to overflow, these lands are generally devoted to corn, an exceedingly profitable crop in such localities, even though subject to occasional damage by floods.

Even the so-called worn-out lands have, by judicious fertilizing, been brought to a high state of productiveness. This region varies in altitude from 180 to 500 and in some instances to 1,000 feet. There are few elevations that are designated as mountains, and lands too steep for the plow are seldom found over the greater part of this area. Pine Mountain in Harris and Graves Mountain in Lincoln rise a few hundred feet above the surrounding country. Atlanta stands upon the crest of Chattahoochee Ridge at an altitude of 1,050 feet above the level of the sea. Kennesaw Mountain in Cobb, with an altitude of 1,809 feet, and Stone Mountain in DeKalb, 1,686 feet above the sea, tower conspicuously over the surrounding landscape.

Southern Georgia, covering more than half of the State, extending from the southern limit of Middle Georgia to Florida and the Atlantic coast, ranges in altitude between 100 and 500 feet. About 3,000 square miles of the coastal region have an elevation of 100 feet or less above tide. The productions of Southern Georgia are very much the same as those of Middle Georgia. Throughout both these sections fruits of many varieties abound. Pears grow well in every part of the State, but best in Northern and Middle Georgia. The apple succeeds well in every portion of the State where the elevation is four or five hundred feet, with a clay soil or subsoil.

It is in Georgia that the most luscious peaches are produced, those having the richest flavor, the best varieties being found in Middle Georgia and the elevated plateaus of the southwestern portion of the State. In the same sections figs and pomegranates grow admirably, needing no protection in winter except in the upper part of the middle belt. Grapes grow well in every section, and there are some fine vineyards. It may be remarked here that, while the founders of Georgia forbade the importation of the stronger liquors, they did intend to make the colony a wine-producing country. Olives succeed well on the coast. The pecan and English walnut do well. Watermelons and cantaloupes are celebrated for their quality. In fact, the Georgia watermelon has a national reputation. In Thomas county, in the extreme southwestern section of the State bordering on Florida, and with but one county (Decatur) between it and the Alabama line, in addition to all the agricultural productions of the temperate and semi-tropical zones, the apple, pear, peach, plum, pomegranate, fig, quince, cherry, grape, raspberry, blackberry, strawberry, mulberry, orange, lemon and banana may be seen, all growing in the same orchard. In Camden county, in the extreme southeast, oranges flourish, and in the streets of St. Mary's the trees may be seen laden in their season with golden fruit. Berries of all kinds flourish in every section of Georgia. Groundpeas and chufas abound; the former being extensively raised for home consumption and the markets of Georgia and other States. Sugar-cane and sorghum are also crops of great value.

No area of similar extent in the United States shows greater variety than Georgia, and no State east of the Rocky Mountains as great. In its southern part tropical fruits and flowers grow and mature, while on the high peaks of some of its mountains grow plants indigenous to the far north. Many people suppose that latitude determines climate. But other factors which also largely control must be taken into the count. Of these factors rainfall, elevation and air currents exert probably the

greatest influence. Of nine climate belts in the United States, eight are represented in Georgia. Of these eight belts the lowest in mean annual temperature is below 40 degrees, the highest between 70 and 75. Thus Georgia's four and one-half degrees of latitude show a variety of climate equivalent to the average range of 15 degrees, according to the usual estimate, which assigns two degrees difference in the thermometer for one degree of latitude, and one degree of the thermometer to three hundred feet of elevation. The climate of below forty degrees is found on some of the mountain peaks known as "bald" above the range of trees, where only shrubs appear, and on whose summit arctic insects are found. Of course there is but a small part of this belt in Georgia.

MEAN ANNUAL TEMPERATURE.

On the sides of these mountains below the summit is a mean annual temperature of between forty and forty-five degrees, corresponding with upper New England and New York and the mountain region of Virginia. A larger climate zone between forty-five and fifty degrees corresponds with portions of New York, Pennsylvania and Ohio. The zone between fifty-five and sixty degrees embraces a narrow strip running through North Carolina and Virginia up to New Jersey. The zone between fifty-five and sixty contains an area two or three times as large as all the preceding zones together, and passing through both Carolinas ends in Virginia. The zone between sixty and sixty-five degrees embraces nearly all of Middle Georgia, upper Alabama, Mississippi, Louisiana, Texas, West Tennessee and Arkansas, and extends into Virginia. The mean annual temperature at some of the important stations in this area are: Leo, 60.1; Rome, 61.9; Gainesville, 61.3; Atlanta, 61.4; Carrollton, 62; Oxford, 62.6; Athens, 63; Augusta, 64; LaGrange, 64.1; Thomson, 64.7. The climate of Southern Georgia corresponds with that of lower Texas, Louisiana, Mississippi and upper Florida, being chiefly in the zone between sixty-five and seventy degrees of mean annual temperature, this zone embracing the following stations: Macon, 66.1; Swainsboro, 67; Cuthbert, 68.1; Americus, 68.2; Walthourville, 67.6; Brunswick, 68.7. Blackshear, 70.2, is the only station touching the zone between seventy and seventy-five degrees. The climate of Atlanta corresponds with that of Washington, St. Louis and Louisville, the winters being warmer and the summers cooler.

For the whole State the July mean temperature is 81.8. The isothermal line of eighty degrees, July temperature, runs above Augusta and Macon to West Point. Above this line, embracing nearly all of North

and Middle Georgia, the July temperature is between seventy-five and eighty degrees. Below this line, embracing nearly all Southwest, East and Southeast Georgia, the July temperature is between eighty and eighty-five degrees.

The only climatic belt in the United States not found in Georgia is that in the extreme south of Florida, with a mean *annual* temperature of between seventy-five and eighty degrees.

Georgia's summers are, on an average, cooler than those of more northerly sections, while the winters, though seldom severe, are cold enough to dissipate the germs of disease.

The annual average rainfall of Georgia is 49.3 inches, the highest being at Rabun Gap, 71.7 inches, the lowest at Swainsboro, 39.4 inches. The average for different sections of the State is: for Middle Georgia, 49.7 inches; Northwest Georgia, 60.3 inches; East Georgia, 41.4 inches. The summer rainfall for the State in inches averages 13.4; North Georgia, 13.6; Southwest Georgia, 14.5. Of summer rainfalls the averages in inches are: Brunswick, 16.6; Americus, 16; Rabun Gap, 15.4; Atlanta, 10.8; Rome, 10.2. Atlanta's annual rainfall is 52.12 inches.

The average elevation above the sea of North Georgia is 1,700 feet; of Middle Georgia, 750; of Southwest Georgia, 400; of East Georgia, 125; of Southeast Georgia, 100, giving an average for the State of 615 feet. Here is a difference between the extreme averages of 1,600 feet.

Snow seldom falls in Southern Georgia, and then rarely to a depth of more than two inches, disappearing entirely in one or two days. There are a few notable exceptions at intervals of several years near the line of Middle Georgia, when it falls to a greater depth, and is followed by a severe freeze and has been known to stay on the ground for several days. In Middle Georgia the fall of snow is slightly more frequent, while its frequency and depth is greatly increased in the mountain region.

The climatic conditions in Georgia are favorable to man and beast. There is no more salubrious climate than that of North Georgia. It compares favorably with that of many sections famed throughout the Union as summer resorts. In North and Middle Georgia summer and autumn are the most delightful seasons of the year. Cool breezes generally temper the sun's rays in the heat of a summer day, and the nights, especially near the mountains, are cool, refreshing, and invigorating. Nothing is more restful to the weary laborer, whether he be a mechanic or a toiler in the fields of thought, than to lie down to slumber unoppressed by the sultriness of a summer night. An evening cooled by gentle zephyrs is a luxury, and such it is one's privilege to enjoy amid the mountains of the northern section or the more elevated portions of

Middle Georgia. Even in Southwest Georgia there are plateaus and ridges with an elevation of from 300 to 500 feet above sea level, where summer nights are refreshing and invigorating. Even in the lowlands of the coastal region and the interior portions also, the heat is greatly modified by the sea breezes which, coming from the Gulf and the Atlantic, cool the summer evenings and nights.

In calculating the healthfulness of the State, the ratio of mortality of the colored population ought to be excluded, since their mode of life, especially in the cities, is far from conducive to health, and their death-rate is far in excess of that of the whites.

The following table shows the average number of deaths in every 1,000 of the population for the year 1890 in the States of Georgia, California, Illinois, New York and Massachusetts:

NUMBER OF DEATHS PER 1,000.

STATES	White	Colored	Total Average Including both Races
Georgia	10.98	15.50	13.24
California	13.42	14.34	13.88
Illinois	13.99	18.43	16.21
New York	17.03	16.25	16.64
Massachusetts	19.48	23.57	21.52

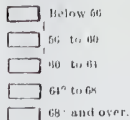
Hence it may be seen that Georgia's climate as compared with the eastern, middle, western middle and extreme western is pleasant and healthful.

The Coastal Region of Georgia abounds in large, deep and navigable rivers, sounds and inlets, offering every facility for commerce and trade, to which advantages should be added the splendid lines of railway that connect the seaports, Savannah and Brunswick, with the highly productive regions of the south, southwest and west. Savannah, though a city of only 54,000 inhabitants, is seventh in the Union in the total value of its exports, is the third cotton port in America and ranks first in the world in lumber and naval stores.

When John Verrazzani, in the service of the king of France, visited the Georgia coast in 1525, he was so charmed with its rivers that he named them after the most noted streams of France. He called the St. Mary's the Seine; the Satilla, the Somme; the Altamaha, the Loire; the Savannah, the Grande; St. Catherine's inlet, the Garonne; Ossabaw Sound, the Gironde.

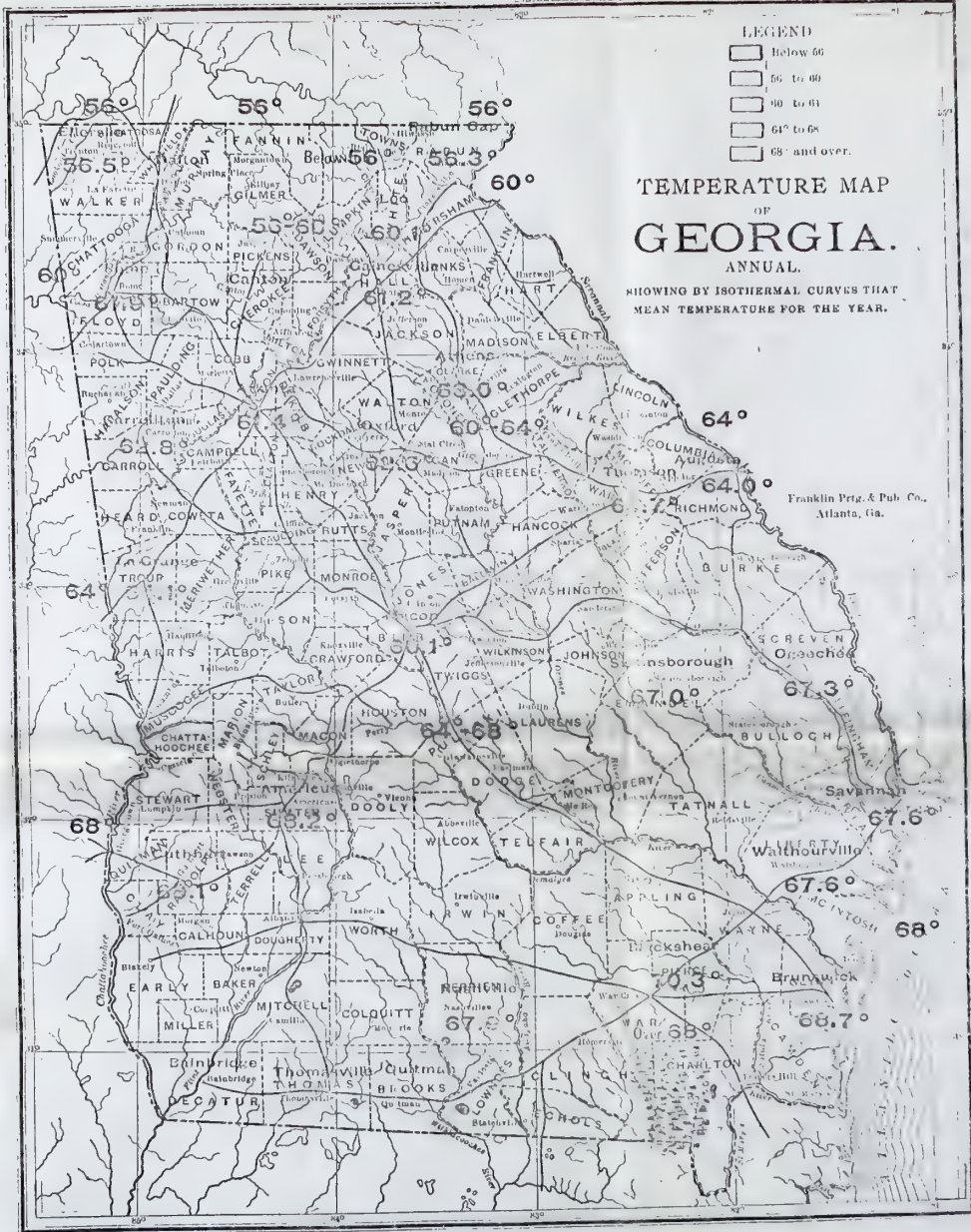
The islands that skirt the Georgia coast produce the famous sea-island cotton. They, as well as the mainlands opposite, furnish great quantities

LEGEND



TEMPERATURE MAP OF GEORGIA. ANNUAL.

SHOWING BY ISOTHERMAL CURVES THAT
MEAN TEMPERATURE FOR THE YEAR.



Franklin Prtg. & Pub. Co.,
Atlanta, Ga.

SCALE



of rice, in the production of which Georgia comes after Louisiana and South Carolina. Some of the largest plantations of this grain, which furnishes such wholesome food to thousands of people, are situated on the banks of the Ogeechee. The lumber business of Southern Georgia, especially of the southeastern section, is of great proportions and has added much to the prosperity of the wire-grass section, if it has not been the greatest factor in its recent rapid development. It has built thriving towns and opened up new fields for commerce, increasing greatly the value of the exports of Savannah and Brunswick, and giving to Darien and St. Mary's their most valuable articles of trade.

Of all the forest trees of the State the long-leaf pine of Southern Georgia, well known as the Georgia pine, holds at the present time the chief place. It is the same as the *Pinus palustris* or *australis*, which is to be found all along the Atlantic and Gulf coasts to a distance of 150 miles back from the sea, from the Potomac to the mouth of the Mississippi. No tree in the temperate zone, and perhaps not in the whole world, serves better the wants of mankind. From its roots to its slender, needle-like leaves, every atom can be utilized. It has a long, slender trunk, often rising to the height of seventy or a hundred feet without a curve or a branch until near the top, where there appears a cluster of branches bearing bunches of needles, long and evergreen, which decay and drop out annually, one after another, and yet never enough at any time to deprive the tree of its richly colored foliage. These pines form a continuous forest for a distance of 1,000 miles, unaffected by frost or heat, growing densely on sandy soil or in the swamps. The ground under them, where it is not swampy, is covered with a carpet of decayed needles of a reddish-brown color, slippery and elastic under the tread. The pine mast or seed is a great food for hogs. The aromatic odor of the pines is very helpful to asthmatic and consumptive patients. The timber which is cut from it is equally good for building, for cabinet work and furniture, is susceptible of high polish, can be furnished in almost any size and length, and can stand exposure to the weather. Some of it has a curly grain, which, when polished, makes furniture beautiful and greatly prized. The roots and bark have medicinal and chemical properties that have for years been utilized. From them the best of lamp-black is made. From the bark comes the highest grades of charcoal. The sawdust furnishes a heavy percentage of alcohol and creosote. The sap, as it oozes from the tree, supplies a gum from which, when thrown into a cauldron, boiled and distilled, there is obtained spirits of turpentine, while the residue in the cauldron is resin, sometimes called resin. This resin is divided into different grades, the finest of which consists

of amber-colored crystals, known as window-glass resin, used on violin bows, for the manufacture of stained glass, and fine painters' materials. North Carolina has long been famed for the production of tar, pitch, turpentine and naval stores; but of late years Georgia has forged ahead of her in these valuable articles of commerce. The short-leaf pine abounds in Middle Georgia and the white pines in Northwest Georgia. In Southeast Georgia is also found the live-oak, a valuable wood for ship-building.

Another valuable wood, the cypress (*Taxodium distichum*), grows along the margins of streams or in swamps with the sweet-gums and black gums. It is found in the country traversed by the Central Railroad from Augusta and Macon toward Savannah, along the Southern Railway from Macon southward and eastward, and in much of the intervening country. This tree attains its largest dimensions in swamps near the coast. Capable of standing exposure well, it shrinks and swells but little when subject to alternations of temperature or of moisture and dryness. These characteristics make its timber especially suitable for shingles, doors, sashes and exterior trimming.

In Middle and Northern Georgia there is an abundant supply of hardwood lumber for manufacturing railroad cars, wagons and agricultural implements, besides a great variety suitable for manufacturing furniture. Among these are oak, hickory, ash, walnut, cherry and maple. In North Georgia there is found also the sugar-maple, the wood of which is light brown and hard. From its sap can be made excellent sugar and syrup.

The pine timber land, which a few years ago could be bought for from 50 cents to \$1.50 an acre, now brings from \$4.00 to \$8.00. Of course the wealth brought into Georgia by the immense pine forests through the trade in lumber and naval stores is of great present benefit to our State. But will not the day come, when through the turpentine ax and the saw these noble pines will disappear and be a thing of the past? Most assuredly yes! What then will be the fate of this section of Georgia? The lands from which the forests have been cleared will be opened up for farms and the staple crops, fruits and vegetables from the cultivated fields and carefully tended truck gardens will find their way to the markets of the North, in which there is a rapidly increased demand for the products of our Georgia farms and gardens. Best of all they will pass through our own ports, bringing into them a continuation of the profits now derived from the shipments of lumber and naval stores. In addition to this the grasses will supply a natural pasturage which, together with the fact that no shelter would be needed

in winter, will make this the choice section of the State for extensive sheep farms.

Not even in Louisiana does the sugar-cane grow more luxuriantly, or yield a greater amount of saccharine juice than throughout this same sand piney belt. In Thomas county vineyards have been, and are very successful, and the best of wines have been made. Experiments at Waycross, in Ware county, show that the soils of that region are admirably adapted to the culture of fruits, figs and grapes. Watermelons can be grown in any quantity and size. In the extreme southern tier of counties oranges and bananas can be produced, and with the same care should be made to do as well as in the neighboring counties of Florida.

Dr. Thomas P. Janes, in his handbook published in 1876, says: "I have seen no section of Georgia in which the people seem to secure a comfortable supply of food with less effort, and can see no reason why the whole country may not be made equal, if not superior, to that section of Prussia, where Frederick the Great founded the city of Berlin. There is the greatest similarity in the soil and topography of the two sections, and should the tide of German immigration be turned hither, there would soon be realized to them the comforts and pleasures of the Fatherland." From the Okefinokee Swamp, in the extreme southeast section, thousands of tons of muck can be obtained which, with the aid of the Satilla river marls, will convert the sandy and red clay lands in its neighborhood into the most productive market-gardens. According to an act passed by the legislature October 29, 1889, and approved by the Governor, John B. Gordon, the Okefinokee Swamp was sold to certain gentlemen incorporated as the Suwannee Canal Company, of which Henry Jackson, of Atlanta, was elected president and A. E. Thornton, vice-president of the Atlanta National Bank, was made vice-president. Explorations made by the company have shown the swamp to be about forty-five miles long, with an average width of about thirty miles. In it are numerous islands covered with long-leaf yellow pine along the central ridges, while on their hammock lands are found the red bay, white bay, magnolia and white holly, known as Henderson wood. This last named tree, when dry, is white like ivory, with a grain not perceptible, and from it excellent piano keys are made. The red bay takes a beautiful polish not much inferior to that of mahogany. The timber bays or cypress brakes running north and south through the swamp, supply the very best quality of black cypress, which will cut from 25,000 to 100,000 feet to the acre. One of the islands, called Billy's Island, was once the home of the Seminole chief, Billy Bowlegs. Okefinokee Swamp abounds in fish and game of all kinds. On some of the islands are found

deer, bears, turkeys, woodcocks, partridges and snipe. Here also dwell the otter, wild cat and panther. The waters of the swamp abound in bream, perch and the large-mouthed black bass, the last being sometimes called trout, which the fishermen, after the primitive Indian fashion, obtain by shooting them with bow and arrow. The cypress brakes are separated from each other by what are called prairies, though covered with water to the depth of two or three feet, which innumerable water lilies cause to resemble a field white with cotton. The water being drained off leaves a muck eight feet deep, the great utility of which as a fertilizer has already been mentioned.

The Georgia sugar-cane crop deserves special mention as one of our most important wealth-producing factors. The striped or ribbon cane, which is now so successfully grown in the southern section of our State was in 1825 introduced from Savannah, Georgia, into Louisiana, which State is now famous for its molasses and sugar industries. Throughout Southern and Middle Georgia this is one of the best crops, and in some localities is raised with profit even as high north as Whitfield county, in the mountain regions. Mr. W. L. Peek of Conyers, a little north of the central part of Middle Georgia, wrote to the Agricultural Department in 1899 that he had made during that season 600 gallons of syrup to the acre, while a letter from Rev. Luke Johnson of Dalton, Whitfield county, reported 300 gallons to the acre from cane raised by him. But in the southern counties are obtained the best results, and Cairo, in Thomas county and Quitman, in Brooks, are perhaps the greatest shipping points for Georgia cane syrup, the rival in our southern markets of the best New Orleans brands and of the famed maple-syrup of the North.

Sorghum syrup, produced from what is called Chinese sugar-cane, is also a great favorite with many of our planters, especially for their negro laborers, by whom it is preferred to almost any other kind.

As a wheat-growing State Georgia is making a record of which her people may well be proud. Mr. J. M. McCandless, State Chemist, after a careful analysis of nineteen Georgia samples, has shown that Georgia farmers can raise as fine wheat as is grown anywhere. The attention that is being given to all the small grain crops is an encouraging sign of the progress being made in diversified farming.

But the greatest wealth-producing factor in Georgia when the farmers first raise their own supplies, and make it their surplus crop, is King Cotton, the fleecy staple, which all the world wants and must have. In 1897-98 and again in 1898-99, Georgia produced 1,500,000 bales, an over-production, and to do this neglected to give to other crops their

proper attention. The price of cotton, which, steadily decreasing for the past two decades, had reached the low figures of four and one-half cents a pound, compelled them now to a change of policy, which had long been urged by the press of the State, notably the *Macon Telegraph*, the *Atlanta dailies*, the *Constitution and Journal*, the *Augusta Chronicle*, the *Savannah Morning News*, the *Columbus Enquirer*, and many other papers of Georgia, and to the adoption of which the Agricultural Department had bent its every effort. Raising first the food crop, they planted cotton in a less, and yet sufficiently large quantity, and the resulting high prices brought renewed hope and prosperity to all classes of our people.

Here it may be not inappropriate to say that the traveler from the North and West passing through the State should not judge Georgia from the ordinary farm scene, viewed from the window of a moving train.

Our railroads generally run along the ridges where the land is poorest, the best lands being away from the great highways of travel. The negro laborer, generally a prominent figure in the scene, is a thriftless sort of farmer who knows only how to plow and hoe, but who, under the intelligent eye of the white man, makes the best of laborers.

A sight of some of the farms where improved methods have been practiced shows conclusively that there is no better country in which to seek for homes, where not merely a comfortable living amid pleasant surroundings can be had, but where, under the skillful hand of the white man, competency and wealth may be acquired.

The water-powers of Georgia are immense, and are estimated at 550,000 horse-power, of which less than 50,000 have been utilized.

The school and church privileges of Georgia are treated in full in the chapters on "Education" and "Religious Denominations."

In the State of Georgia there were in 1890 440,459 sheep with a wool clip of 841,141 pounds; 873,926 cattle, of which 49,108 were working oxen and 287,717 were milch cows. Of the cows 3,931 were pure bred and 28,148 were graded as one half blood or higher. There were produced 53,234,508 gallons of milk, 14,483,323 pounds of butter and 12,833 pounds of cheese.

There were also 103,501 horses, 156,860 mules, 517 donkeys, 1,396,362 swine, 7,357,934 chickens, 148,797 turkeys, 291,676 geese, and 105,537 ducks. There was a production of 11,522,788 dozens of eggs, and 1,757,758 pounds of honey.

The annual report of the Bureau of Animal Industry for 1899, published by the United States Department of Agriculture, gives the number

of sheep in Georgia as 294,826, valued at \$518,893, yielding 1,218,612 pounds of wool, washed and unwashed, and 731,167 pounds of scoured wool. The Year Book published by the same department for 1900 places the number of sheep in Georgia at 271,534, yielding 1,086,136 pounds of wool, washed and unwashed, and 651,682 pounds of scoured wool. This indicates a steady decrease in the sheep and wool industry of Georgia. Are our farmers going to let this state of affairs continue, and allow an industry which, under proper conditions, would be a great source of wealth to our State to go to ruin for the lack of such laws as will give the sheep proper protection?

CHAPTER III.

ECONOMIC GEOLOGY AND MINERALOGY.

In the steady growth of industrial development that is taking place along various lines in Georgia, the mineral resources of the State are not being neglected, and the subject of economic geology and mineralogy is claiming each year a larger share of attention. Through the active and systematic work, both of private individuals and of the State Geological Department, thoughtful men are realizing more and more that this phase of the State's material development is only in its childhood, and that a most promising field here awaits the trained worker and the capitalist.

A brief outline is here given of the general geologic features of the State, together with a short account of some of the most valuable mineral deposits, building-stones, water-powers, etc.

By reference to the accompanying map it will be seen that the State is divided geologically into three main divisions: 1st. The Paleozoic area in the northwest, embracing the counties of Dade, Walker, Catoosa, Whitfield, Chattooga, Floyd and the greater parts of Murray, Gordon, Bartow and Polk; 2d. The Crystalline area, including all that portion of the State north of a line through Columbus, Macon, Milledgeville and Augusta and not embraced in the Paleozoic area; 3d. The Coastal Plain area, beginning at the line above described and taking in all the southern portion of the State.

In the Paleozoic area Cambrian, Silurian, Devonian and Carboniferous formations are represented. The rocks are principally shales, sand stones, limestones, quartzites and cherts.

The general surface configuration presents a region of parallel valleys and mountain ridges, the bulk of the area forming a portion of the great Appalachian valley.

In this area are valuable deposits of coal and ores of aluminum and manganese. The roofing-slate of the State is found here, and all the iron deposits that have been so far worked are in this area.

The Crystalline area is composed of granites, schists and gneisses, with intruded basic eruptives of later age. The rocks of this area are of

great age, but their exact position in the geological time scale has not yet been definitely decided upon.

The Blue Ridge Mountains, the easternmost of the Southern Appalachians, traverse this region in a northeast southwest direction. From the southern foothills of this range the land surface slopes gradually seaward to its junction with the Coastal Plain. This portion of the area is known as the Piedmont Plain. Atlanta, situated in the upper part of this belt, is 1,050 feet above sea level.

Conspicuous among the minerals of commercial importance in the Crystalline area are gold, corundum and asbestos.

The best building-stones in the State are also in this region and near the contact between it and the Paleozoic.

The Coastal Plain is much younger, geologically, than either of the other two areas and is very different from the adjoining crystalline area, both in the character of the rocks and the surface configuration. The great mass of the strata is of Eocene and Miocene age, overlaid by the Lafayette and Columbia formations. In the northwest corner a considerable area of underlying Cretaceous rocks have been exposed through the removal by erosion of the latter formations. These rocks have their greatest width at the western end of the belt, but according to Dr. Geo. E. Ladd, they can be traced clean across the State into South Carolina.

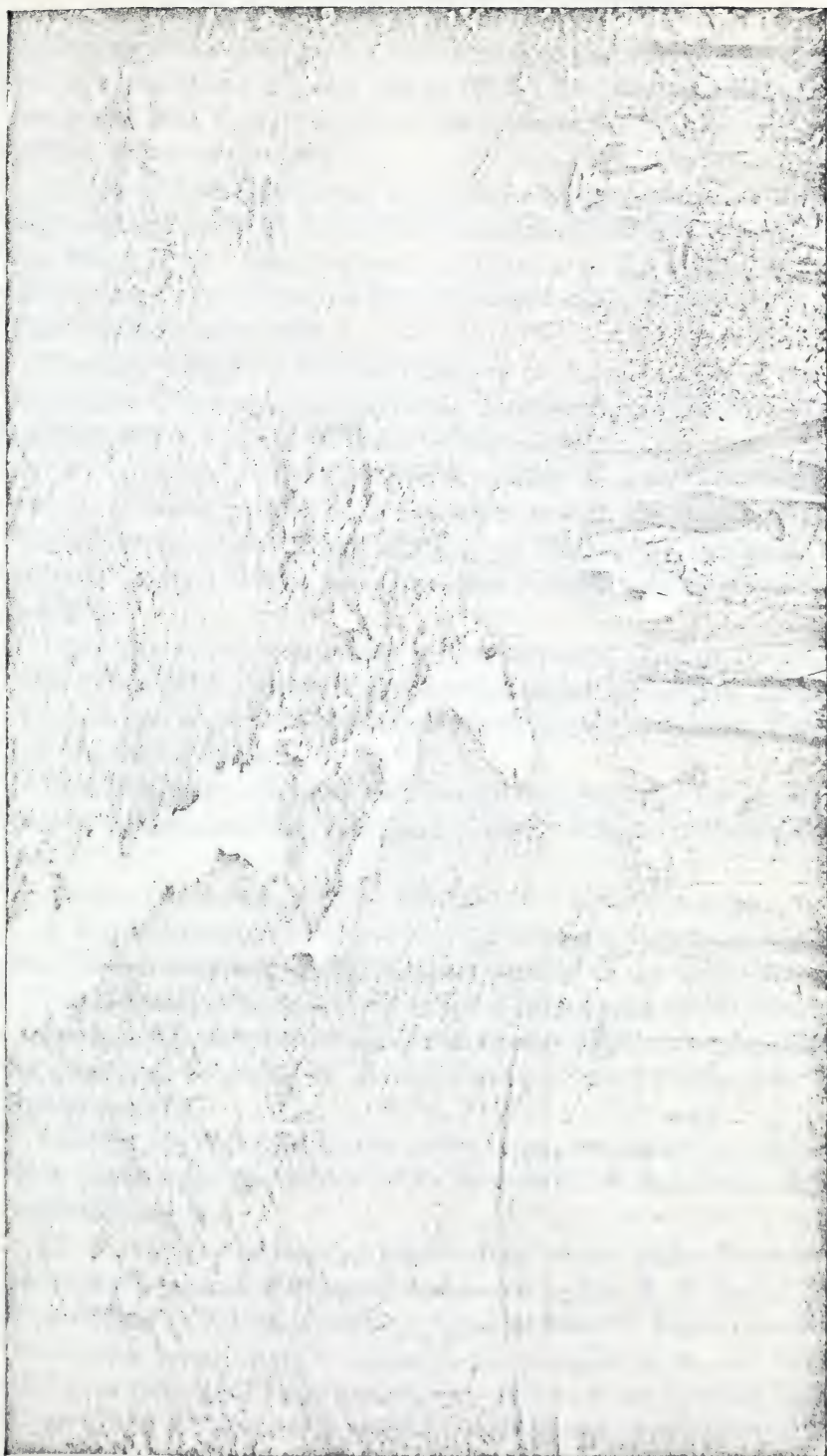
The rocks of the coastal plain consist of loosely consolidated sands and gravels, with clays, marls and limestones. In passing from the harder formations of the Crystalline area to these much softer rocks, all of the rivers form falls or cascades. The line marking the junction of the coastal plain with the Crystalline area is hence called the "fall line." Up to this line all of the larger streams, flowing through the flat, low lying coastal plain, are navigable. The fall line, forming the head of navigation and affording important water-powers on the streams, determined the location of a number of important towns—Columbus, Macon and Augusta.

In the coastal plain are found the finest clays of the State and valuable beds of marl.

GOLD.

Gold is known to have been found in Georgia in 1829 on Duke's creek in White county, that part of the county where the discovery was made, being at that time a part of Habersham county. It is also claimed that it was found a year prior to this in Lumpkin county. By the year 1830 the "gold fever" had fully developed in Georgia. In 1831 \$212,000 was sent from Georgia to the United States Mint, and in 1838 the United

PLACER MINING AT THE WHITE PATH GOLD MINE, GLIMMER CO. N.Y., GA.



State government established a branch mint at Dahlonega, which continued in operation till the civil war in 1861. The greatest output of any one year during these twenty-four years was in 1843, when over a half million dollars were coined.

The State Geological Survey estimates in Bulletin No. 4—A, that the total production of gold in the State, from its earliest discovery till 1896, was \$16,228,730. Statistics from the Director of the mint show a total coining value of \$546,006 for the gold received from Georgia during the four years following 1895.

The gold deposits of Georgia form one of the main belts of the gold fields of the Southern Appalachians. Two auriferous areas, as defined in Bulletin No. 4—A of the State Geological Survey, are to be traced on the southeast side of the Blue Ridge running in a northeast-southwest direction, closely parallel with the main axis of the mountain range. The northernmost and largest of these two belts is the Dahlonega belt. It has a length of about 150 miles with a width varying from one to five miles.

Beginning with Rabun county it runs southwest through Habersham, White, Lumpkin, Dawson, the northwest corner of Forsyth, Cherokee, the northwest corner of Cobb, the southeast corner of Bartow, Paulding and Haralson counties.

The other belt, called the Hall county belt, traverses the counties of Rabun, Habersham, Hall, Gwinnett, Forsyth, Milton, DeKalb and Fulton.

A third belt traverses Cobb, Paulding and Carroll counties.

A fourth belt may be traced through Lincoln, Columbia, McDuffie and Warren counties, in the southeast portion of the Crystalline area.

The Dahlonega belt is the largest and most important of all these belts.

Besides these well-defined areas many irregularly located deposits may be mentioned occurring in Towns, Union, Gilmer, Fannin and Meriwether counties.

Gold is to be found in Georgia under three conditions: 1st. As water-worn pebbles and fine grains in the beds of the streams traversing the auriferous regions.

2d. In veins or leads, the gold-bearing quartz generally occurring in lenticular masses or stringers, designated by Mr. G. F. Becker of the United States Geological Survey, "stringer leads." Small cross fissure veins often occur at right angles to the principal leads, and the wall rocks are frequently impregnated with gold to a considerable distance. Beneath the influence of atmospheric weathering these leads yield the

so-called "refractory" ores, requiring expensive treatment for the production of the gold.

3d. In decomposed wall-rock and included vein material. The decomposition *in situ* of the wall-rock, which is generally a gneiss or schist, varies in depth at different localities, sometimes amounting to as much as a hundred feet. For this rotten material Mr. Becker has proposed the term "saprolite."

The richer placer mines in Georgia have long since been exhausted, though dredging operations are at present being successfully conducted on some of the rivers in the Dahlonega belt.

In Lumpkin county the working of the saprolites constitutes the principal mining operations now being carried on.

The material is washed out of its bed by directing against it a stream of water under high pressure from a hydraulic giant, and is conducted away in flumes or sluice-boxes, the ore and fragment of partially decomposed wall-rock being carried to the stamp mill where it is to be crushed, while the free gold is caught in the riffles with which the flumes are lined and collected with mercury.

Deep mining has been developed as yet to only a limited extent in Georgia. A good example of this kind of mining is to be found in the Creighton, formerly known as the Franklin mine, in Cherokee county. Here the undecomposed sulphides have been taken out for a depth of several hundred feet, by sinking shafts and driving drifts at one hundred-foot levels. The chlorination process is employed in the extraction of the gold. This and the Royal mine, in Haralson county, serve as an index to what may be accomplished in the future with the sulphurets ores.

Activity in mining matters has been very marked in the region of Dahlonega for the past two years, and large sums have been invested.

The following quotations may be taken as a summary in regard to the economical features of gold mining in Georgia:

The first is from a paper on the gold deposits of Georgia, read by Mr. S. W. McCallie, Assistant State Geologist, before the International Gold Mining Convention, held at Denver, Colorado, July 8, 1897.

"The future of the gold mining industry of the State depends, to a great extent, on the economic treatment of low-grade ores which are known to exist in large quantities."

The other is from Prof. W. S. Yeates, State Geologist, who, in the concluding chapter of Bulletin No. 4—A, of the State Survey, on a part of the gold deposits of the State, says: "I do not believe that the Georgia gold mines may be expected to produce bonanzas; and the fortunes to be made in a day will be exceedingly rare; but there is every reason to

believe, that when properly developed and equipped for extensive operations, the gold deposits of Georgia will rank among the best dividend producers of the world."

Among some of the well-known mines in the State may be mentioned the Barlow, Finley and Hand mines in Lumpkin county, the Creighton mine in Cherokee county, the Loud mine and the Yonah Gold mines in White county, and the Royal mine in Haralson county.

SILVER.

Ores of silver in any quantity have never been found in Georgia. As a by-product in the refining of the gold sent by the State to the United States Mint, silver to the coining value of from six to seven hundred dollars is derived annually.

IRON.

The iron ores of Georgia furnish one of the most valuable of the various mineral products of the State.

All the ore so far mined has been taken from the Paleozoic area, though deposits of limonite (brown iron ore) that would warrant being developed are to be found in several localities in the Crystalline area, and magnetite also occurs in this area; but whether in workable quantities or not has not yet been determined.

The ores of the Paleozoic area consist of the brown iron ores or limonite, and the red ores, or hematite.

The brown ores furnish the bulk of the material taken out and are mined at present in Bartow, Polk and Floyd counties.

Mr. S. W. McCallie, Assistant State Geologist, in an article written for the *Engineering and Mining Journal*, has described in outline the occurrence and character of these ores. According to him, the most abundant deposits occur in pockets, or irregular deposits, in residual clays that have resulted from the weathering of an extensive magnesian limestone formation of Lower Silurian age, known as the Knox Dolomite. From a number of analyses he concludes that the ore will yield from forty-eight to fifty per cent. of metallic iron.

Other deposits of less extent occur in Cambrian and Carboniferous formations.

Most of the limonite of this region is not pure limonite but is the hydrous sesquioxide of iron, having a greater or less per cent. of the anhydrous oxide or hematite mixed with it, giving the typical "brown ore" of commerce.

The red iron ore is mined in Walker and Chattooga counties. It is a fossiliferous hematite usually correlated with the Clinton beds of New York. Below the influence of atmospheric weathering the ore carries a considerable percentage of lime.

According to statistics kindly furnished by Dr. David T. Day of the United States Geological Survey, the output of iron ores in Georgia for 1899 was 236,748 long tons, valued at \$235,343.

A few blast furnaces are in operation in the iron-mining region, but the greater part of the ore mined is shipped to other States.

OCHER.

Yellow ocher, an earthy form of hydrated iron oxide, used in the manufacture of paints and pigments, and linoleum, occurs in Bartow county. The ocher of these deposits is of good quality and is favorably known to the trade. The following is an analysis of a sample by Mr. N. P. Pratt:

Hygroscopic moisture .....	.60
Water of combination	9.31
Free silica (sand)	7.10
Silica as silicates	6.51
Alumina	8.86
Iron peroxide	66.82
	<hr/>
	99.20

The production of mineral paints in Georgia in 1899, as shown by figures furnished by Dr. Day, was 3,212 short tons, valued at \$39,505.

Mr. J. J. Calhoun of Cartersville, Ga., informs us that the shipment of yellow ocher from Bartow county from August 1, 1899, to August 1, 1900, was 4,500 tons.

MANGANESE.

The oxide of manganese constitutes another of the more valuable mineral products of the State. Manganese ore of fine quality occurs in Bartow and Floyd counties, where it is extensively mined. There are also deposits of less extent in other counties in the Paleozoic area. Manganese is used for a number of purposes in the industrial arts and sciences, especially in the manufacture of steel and in the preparation of chlorine gas.

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The production of manganese in Georgia has fluctuated greatly during different periods. In 1898, as shown by the twentieth annual report of the United States Geological Survey, Georgia led all the States in the production of manganese, the output being 6,689 long tons, valued at \$6.21 per ton. In 1887 the output reached a little over nine thousand tons.

In 1899 the total amount as shown by the figures furnished by Dr. David T. Day, was 3,089 long tons, valued at \$23,377.

BAUXITE.

Extensive deposits of this mineral occur in the Coosa valley of the Paleozoic area. The largest deposits are in Floyd and Bartow counties, but its occurrence is also to be noted in Polk, Walker and Chattooga counties.

Bauxite is a hydrate of the metal aluminum, and is the principal source of the aluminum of commerce. It is also largely used in the manufacture of alum. It occurs in commercial quantities in only three other localities besides Georgia in the United States: in Alabama, where the deposits are a continuation of those in Georgia, in Arkansas and in New Mexico, to a limited extent.

In Georgia the ore occurs in pockets or distinctly defined bodies, and can generally be extracted with pick and shovel without resorting to blasting. The bulk of the ore is very pure and is worth from \$3.50 to \$4.50 per ton at the mines. The production has varied considerably during different years. The production in the United States is at present confined to Georgia and Alabama. In 1897, as shown by the United States Geological Survey Report, the output from the two States was 20,590 long tons, valued at \$57,652. Of this, 7,507 tons were from Georgia.

CORUNDUM.

Corundum occurs in a number of counties in the Crystalline area and may be ranked as one of the important mineral products of Georgia.

Corundum, used in its broadest sense, is a term for all native occurring oxide of aluminum, including the precious stones, ruby and sapphire. In a more restricted sense, it is used for all the non-transparent varieties of dark or dull color.

Emery is a black or grayish-black, granular corundum having some iron oxide, either hematite or magnetite, intimately mixed with it.

Corundum, using the term in its more restricted sense, like bauxite, occurs in commercial quantities in the United States in a limited number of localities. The other States producing it besides Georgia are North Carolina, Pennsylvania, New York and Massachusetts. The Georgia deposits occur in a belt of considerable width running in a parallel direction with the main axis of the Blue Ridge mountains on their southeast side. Some occurrences are to be noted, however, in Towns and Union counties on the other side. The belt runs from Rabun and Towns southwesterly to Carroll and Heard counties. The most important deposits are in the northeast end of the belt in Rabun, Towns, Union and Habersham counties.

According to Mr. Francis P. King, formerly Assistant State Geologist, the deposits occur in veins intersecting basic magnesian rocks of which peridotite may be taken as a type. These basic magnesian rocks form igneous intrusions in the prevailing gneiss and schists that make up the country rock.

In Bulletin No. 2 of the State Geological Survey, page 74, Mr. King says: "A matter of note is the constant presence of hornblende gneiss, either on one side or the other, of these formations. Such being the case, and since these gneissic-hornblende formations, varying from fifty to three hundred feet and more in width, are continuous for miles across the country, they act as an excellent guide in a search for the corundum-bearing formations. Gneiss or mica-schist seems always to surround the peridotites, or "chrysolite formations," as they are commonly called, the hornblende gneiss apparently never coming in close contact with the peridotites."

The largest mine in the State, and one of the noted ones of the United States, is the Laurel Creek Mine in Rabun county near the Carolina line.

Corundum is the hardest of all naturally occurring substances, the diamond excepted, and its extensive use as an abrasive was the natural sequence to its discovery and a knowledge of its physical properties.

PYRITE

Pyrite, the naturally occurring sulphide of iron, is widely distributed in small quantities throughout the northern part of the State, but so far it has not been found in sufficiently concentrated deposits to warrant mining operations, except in a few localities.

Pyrite is extensively used in the manufacture of sulphuric acid, and

where deposits occur not too remote from transportation facilities, they are well worthy of attention.

The best prospects for this mineral seem to be in Lumpkin county.

COPPER.

Copper ores occur in Murray and Fannin counties as a continuation of the Tennessee deposits, and mining operations are carried on to a limited extent in the upper part of these counties.

GRAPHITE.

Graphite occurs in a number of localities in the northern part of the State, but whether in quantities of a quality that would repay systematic development is not known.

Graphitic schists have been mined in considerable quantities near Emerson, Ga., for use in the manufacture of fertilizers.

ASBESTOS.

Asbestos occurs at a number of localities in the Crystalline area. Georgia and California are the only States in the Union in which it is mined, the most of the asbestos used in this country being imported from Canada.

Asbestos finds various uses in the industrial arts where a heat-resisting substance is needed, as in the manufacture of fire-proof safes and other articles liable to be subjected to high temperature. Being a good non-conductor it is also extensively used for wrapping pipes in steam-heating, etc.

The asbestos found in Georgia is a fibrous variety of the common mineral hornblende, and is the true asbestos of mineralogists. The Canada asbestos is a fibrous form of the mineral serpentine called chrysotile.

Figures furnished by Dr. Day show six hundred and fifty short tons to have been mined in Georgia during 1899, valued at \$10,500. The most extensive mine in the State is located at Sall's mountain in White county. Mines have also been opened up in Rabun, Meriwether and other counties.

TALC.

Talc occurs in a number of counties in the northern part of the State, the principal deposits occurring in the contact region of the Paleozoic and Crystalline areas.

Mining operations have been carried on from time to time in Murray, Fannin and Cherokee counties.

Soapstone is a compact massive variety of talc. This mineral is used as a lining in stoves and furnaces and for other similar purposes. Talc ground to a powder is used as a lubricator, and the finer varieties can be used for crayons and various purposes.

MICA.

Mica occurs widely distributed over the Crystalline area, but little has been done as yet towards the development of the mica industry in Georgia, although deposits have been worked in Union and Fannin counties.

The marketable value of mica depends on the size of the cleavage sheets that it will yield and their freedom from flaws and discoloration. The usual occurrence of mica is in pegmatitic dikes or veins, of which it forms one of the constituent minerals along with quartz and feldspar.

BARITE.

Barite, or heavy spar, the sulphate of barium, occurs in the Paleozoic area in Bartow county, where it has been mined for a number of years. Its chief use is in the manufacture of paint as a substitute for white lead.

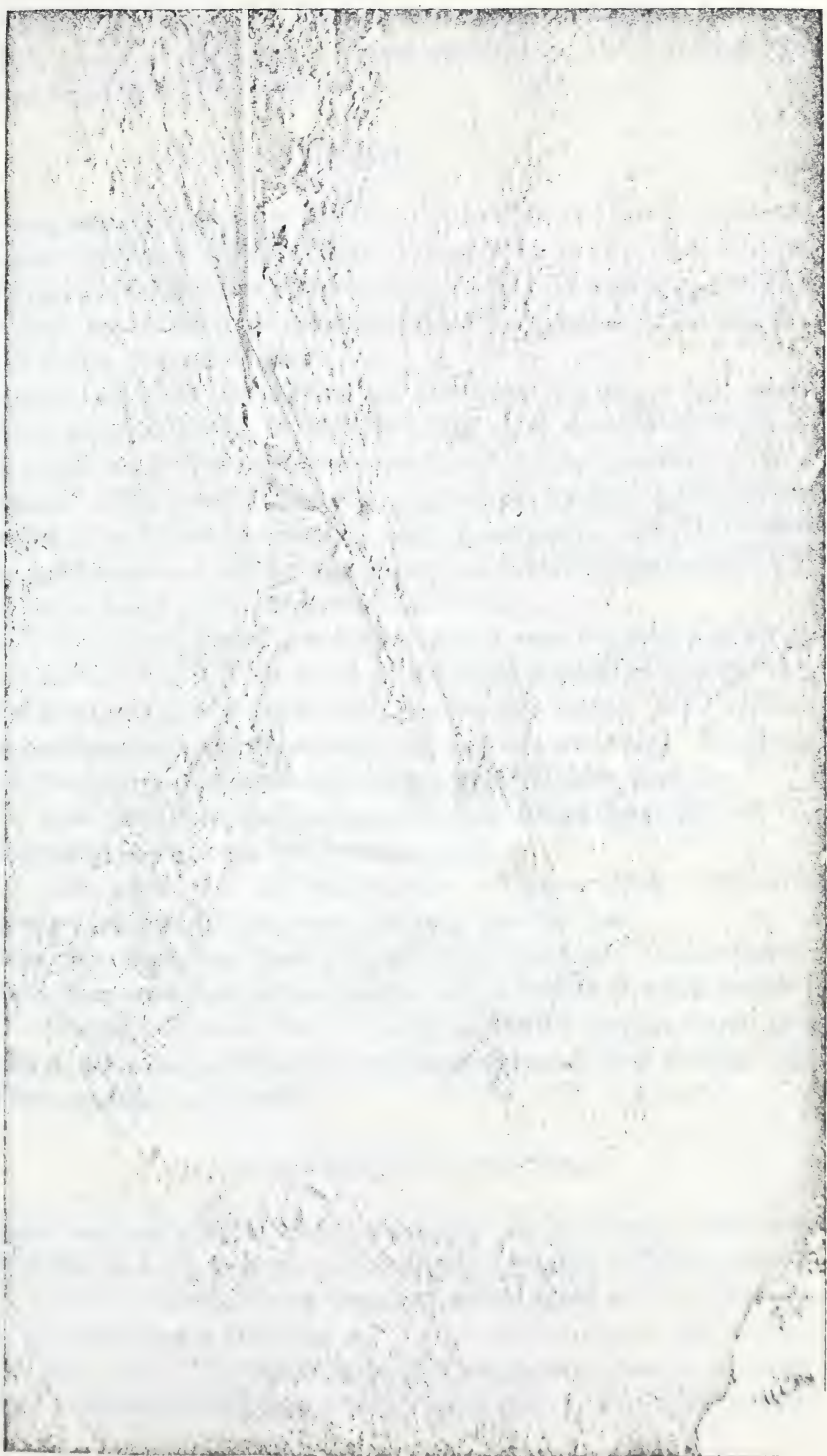
PRECIOUS STONES.

Amethysts of good quality are found in Rabun county. A few diamonds have been found in Hall county. Rubies and sapphires of small size have been obtained in limited numbers in connection with corundum mining, and some green beryl suitable for cutting has been found in the northeast part of the Crystalline area. Some good moonstones have been cut from feldspar from Upson county.

COAL.

The coal fields of Georgia are in Dade and Walker counties in the Paleozoic area and are a part of the Warrior coal field of Alabama. The following figures taken from the twentieth report of the United States Geological Survey, giving the output in short tons from 1890 to 1898 will give an idea of the extent of the industry.

1890	228,337	1895	260,998
1891	171,000	1896	238,546
1892	215,498	1897	195,869
1893	372,740	1898	244,187
1894	354,111		



HYDRAULIC MINING AT THE SINGLETON MINE, LINCOLN COUNTY.

Statistics furnished by Dr. Day show an output of 233,111 short tons in 1899, valued at \$233,344. A good per cent. of the coal mined in Georgia is converted into coke.

CLAYS.

Throughout that portion of the State north of the fall line (a line from Columbus through Macon to Augusta) clays occur *in situ*, derived from the feldspathic constituents of the country rocks. At numerous localities these clays are suitable for the manufacture of common brick and the coarser grades of earthenware.

Immediately below the fall line and extending in a narrow belt across the State are to be found, in addition to the clays suitable for the purposes mentioned above, extensive deposits of what is technically termed "fire clay." This term is used for a clay of comparative purity which subjected to heat fuses at relatively high temperatures, and can be used in the manufacture of burnt products, such as porcelain, enameled brick, china wares, sewer pipes, terra-cotta, etc.

Dr. Geo. E. Ladd, from his work in the clay area, the results of which are set forth in Bulletin No. 6—A of the State Geological Survey, concludes that these clay deposits were formed at a period when the sea-shore approximately coincided with the fall line previously described; the clay beds accumulating in lagoons and quiet off-shore stretches.

The most important deposits occur in the lowest formation of the Cretaceous beds, known as the Potomac group.

Extensive plants for the manufacture of sewer pipes, terra-cotta articles, etc., are located at several points in the clay belt.

Pure white clay, free from grit, is largely used in the manufacture of wall-paper, and much of the Georgia clay is suitable for this purpose.

The twentieth United States Geological Survey Report shows that articles to the value of \$834,908 were manufactured from Georgia clay in 1898, exclusive of pottery.

MARLS AND PHOSPHATES.

Numerous beds of marl occur in the counties forming the lower part of the State, and can be used to advantage for marling adjacent lands.

Mr. McCallie, Assistant State Geologist, in his report on the Phosphates and Marls of Georgia (Bulletin No. 5—A), in referring to the marls of New Jersey, says: "The marls in South Georgia are found in many instances to equal in plant-food those of New Jersey; and if abundantly

and judiciously used, there appears to be no reason why they might not produce a similar effect on the fertility of the soil."

Deposits of phosphate have been found and mined to a limited extent in Thomas county.

LIMESTONE.

Limestone beds of good quality, both for calcimining and for building purposes, are found in the Paleozoic area. Lime for local consumption has also been made for years from a narrow belt of limestone in Hall and Habersham counties, in the Crystalline area.

Limestone suitable for calcimining is also to be found at different localities in the coastal plain region.

Figures from the United States Geological Survey Report show the production of lime in Georgia in 1898 to have amounted to \$57,803. This indicated an increase of \$25,803 over that in 1897, and of \$28,722 over the production for 1896.

Hydraulic cement rock is also found in the Paleozoic area. A good cement is obtained from beds in Bartow county. The production of cement in Georgia in 1898, as given by the United States Geological Survey Report, was valued at \$13,500.

ROOFING-SLATE AND STONES FOR BUILDING, INTERIOR DECORATIVE WORK AND MONUMENTAL PURPOSES.

SLATE.

Roofing-slate of good quality is quarried at Rockmart in Polk county.

In the twentieth report of the United States Geological Survey, the production in Georgia for 1898 is put at 3,450 squares, valued at \$13,125.

Figures received from Dr. Day show the value of the output for 1899 to have amounted to \$7,500.

MARBLE.

The marbles of Georgia occur in a narrow belt about sixty miles long in the contact region of the Paleozoic and Crystalline areas. The belt traverses Fannin, Gilmer, Pickens and Cherokee counties. The most important quarries are in Pickens county.

For a number of years the marble industry in Georgia has steadily grown in importance, and at the present time Georgia marble is recog-

nized all over the Union as one of the most superior stones for building and decorative work that can be purchased.

The following figures giving the production from 1890 to 1899, from the United States Geological Survey Report, and those for 1899 furnished by Dr. Day, show the importance of the industry:

1890	\$196,250	1895	\$689,229
1891	275,000	1896	617,380
1892	280,000	1897	598,076
1893	261,666	1898	656,808
1894	724,385	1899	742,554

Many handsome structures have been built in various parts of the country of Georgia marble and testify to its beauty and popularity as a building-stone.

Among others may be mentioned the State capitol of Rhode Island and the Corcoran Art Gallery at Washington.

GRANITE.

Granites of good quality occur in immense quantities in a number of localities in the Crystalline area. Large amounts are quarried annually for building, street-paving and monumental work.

Stone Mountain, in DeKalb county, is an immense mass of granite about six hundred and fifty feet high, and having a circumference at the base of something like seven miles. Extensive quarrying operations have been carried on at this mountain for years.

Among others, a belt of blue granite, designated by Dr. Thos. L. Watson, Assistant State Geologist, as the Lexington-Oglesby blue granite belt, traverses Oglethorpe and Elbert counties and furnishes most superior stone for decorative and monumental work.

Dr. Watson, who is just completing an extensive report for the State Geological Survey on the granites of Georgia, is authority for the statement, that, "there is in the State an abundance of granite suitable for the various purposes to which the stone is put, of a quality unexcelled anywhere."

From figures received from Dr. Day it is seen that the granite output of the State in 1899 was valued at \$411,344.

GNEISS.

At Lithonia, Georgia, large quantities of contorted gneiss are quarried. There is a number of localities in the Crystalline area where gneiss can be had, suitable for curbing and paving stones.

SANDSTONE.

Sandstones suited for building work are to be found in several counties in the Paleozoic area. A very fine, brown sandstone is quarried in Cataosa county.

An interesting exhibit of sample cubes of the various building-stones of the State has been arranged by State Geologist Yeates, and is kept on exhibition in the museum at the State capitol.

MINERAL SPRINGS, ARTESIAN WELLS AND
WATER-POWERS.

MINERAL SPRINGS.

A number of mineral springs of note are to be found in the Paleozoic and Crystalline areas. Among those of medicinal value may be mentioned, chalybeate, sulphurous and lithia waters.

The twentieth United States Geological Survey Report shows an output of 197,100 gallons of mineral waters in Georgia in 1898, valued at \$39,230.

ARTESIAN WELLS.

The artesian wells of Georgia are confined to the coastal plain region. Mr. S. W. McCallie, in Bulletin No. 7 of the State Geological Survey, in the concluding chapter of his report on the artesian wells, says: "While there is much yet to be learned about the underground water system of the coastal plain, there is, nevertheless, sufficient known already to warrant the statement, that almost this entire portion of the State is underlaid by pervious beds, which will furnish large quantities of pure, wholesome water when pierced by the drill. It is not to be inferred by this statement, however, that these water-bearing beds will furnish flowing wells. On the contrary, the flowing wells will be found to be limited to certain areas not yet fully defined."

It is further shown by Mr. McCallie's report that the average depth of the wells already bored is about 450 feet, and that the various strata penetrated consist of soft limestones, clays and sands, so that the wells can be had for a comparatively small outlay of money.

The marked sanitary advantages that have resulted to many towns in Southern Georgia through the supply of pure, wholesome drinking water, obtained from artesian wells, hardly requires comment.

WATER-POWERS.

The streams of Georgia furnish water-powers at numerous localities, varying in amount of power all the way from that furnished by the small cascade that runs the farmer's individual mill to that of the great shoals and falls, amounting to from 20,000 to 30,000 horse-power.

The drainage system of the State comprises nine basins, as follows: 1st. The Tennessee basin, drained by tributaries of the Tennessee river. 2d. The Mobile basin, draining into the Gulf of Mexico by the Coosa and Tallapoosa rivers. 3d. Apalachicola basin, drained by the Chattahoochee and Flint rivers. 4th. The Altamaha basin, drained by the Oconee and Ocmulgee rivers, which empty into the Altamaha, flowing to the Atlantic Ocean. 5th. The Ogeechee basin, drained by the Ogeechee river into the Atlantic Ocean. 6th. The Savannah basin, drained by the Savannah river into the Atlantic. 7th. The Ocklockonee basin, drained into the Gulf through Ocklockonee bay. 8th. The Suwannee basin, drained into the Gulf by the Suwannee river. 9th. The Satilla and St. Mary's basin, drained by the rivers of the same name into the Atlantic.

Speaking generally, and leaving out a few notable cases, the largest water powers of the State occur at or just above the fall line running through Columbus, Macon and Augusta, where the streams pass from the hard rocks of the Crystalline area to the softer formations of the coastal plain; and on the line formed by the contact of the Paleozoic and Crystalline areas in the northwest. This latter line passes through Polk, Bartow, Gordon and Murray counties, and is known as the western fall line as distinguished from the other, which is called the southern fall line.

In addition to the larger powers located on these fall lines, numerous other powers are to be found at various points on different streams throughout the State.

The following list of important streams and tables of powers is taken by permission from Bulletin No. 3—A, of the State Geological Survey:

TENNESSEE BASIN—IMPORTANT STREAMS

STREAM.	TRIBUTARY TO	COUNTY.	REMARKS.
Nickajack Creek	Tennessee River	Dade	The streams of Fannin, Union and Towns counties are a succession of shoals from their heads to the State line; but no surveys have been made of the water-powers.
Lookout Creek	"	"	
Chattanooga Creek	"	Walker	
Chickamauga River	"	"	
West Chickamauga Creek	Chickamauga River	Catoosa	
Middle Chickamauga Cr.	"	Whitfield	
East Chickamauga Creek	"	Fannin	
Toccoa River	Hiwassee River	"	
Fightingtown Creek	Toccoa "	"	
Hempston Creek	"	"	
Nantootie Creek	Hiwassee River	Union	
Notley River	Tennessee River	Towns	
Hiwassee River	Notley River	Union	
Cooper's Creek	Hiwassee River	"	
Brasstown Creek	"	"	
Choestoe Creek	"	"	
Wills Creek	"	"	

MOBILE BASIN—IMPORTANT STREAMS.

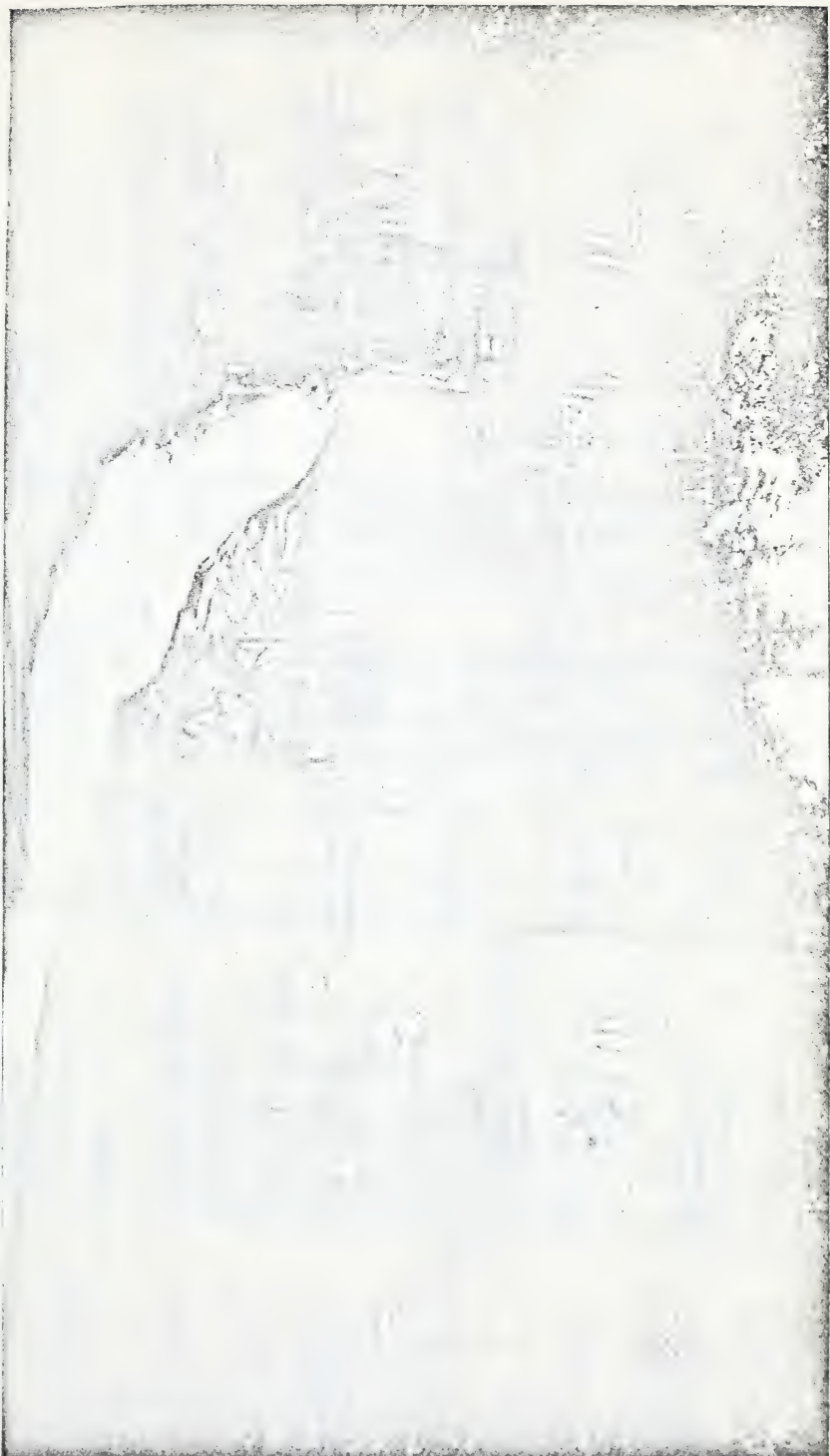
Coosa River	Alabama River	Floyd	{ Formed by junction of Oostanaula and Etowah at Rome (navigable water). Furnishes power to Trion Factory.
Chattanooga River	Coosa River	Chattooga	
Duck Creek	Chattanooga River	Walker	Navigable.
Silver Creek	Coosa River	Floyd	
Cedar Creek	"	Polk and Floyd	
Oostanaula River	"	Gordon and Floyd	
Armuchee Creek	Oostanaula River	Chattooga and Floyd	{ Succession of cataracts for 17 miles, from Ellijay to Carter's Mill; navigable below.
John's Creek	"	Floyd	
Ortheast Creek	"	Gordon and Bartow	
Comasauga River	"	Whitfield and Murray	
Coosawatee River	"	Gilmer and Gordon	

Sallacoon Creek.....	Coosawattee River.....	Gordon.....	Large mountain stream. (No survey.) { Large power at Ellijay, and others up the stream. } (No survey.) { Flows also through Dawson, Cherokee and Bartow Counties.
Talking Rock Creek.....	".....	Pickens.....	
Mountain Town Creek.....	".....	Gilmer.....	
Scared Creek.....	".....	Pickens.....	
Ellijay River.....	".....	Gilmer.....	
Carteay River.....	".....	Gilmer.....	{ Has one cotton factory and many undeveloped } shoals. { The great Marble Valley of Pickens County. See } table for power.
Etowah River.....	Coosa River.....	Lumpkin and Floyd.....	
Euharlee Creek.....	Etowah River.....	Polk and Bartow.....	
Raccoon Creek.....	".....	Paulding.....	
Pumpkinvine Creek.....	".....	".....	
Allatoona Creek.....	".....	Cobb and Bartow.....	{ Amicalola Falls, 625 feet high, on head waters. } { See table for power. } Source of Kin Mori mining ditch, 35 miles long.
Little River.....	".....	Gilmer.....	
Shoal Creek.....	".....	".....	
Sharp Mountain Creek.....	".....	Cherokee and Pickens.....	
Long Swamp Creek.....	".....	Pickens.....	
Sitting Down Creek.....	".....	Forsyth.....	{ Source of Cincinnati Consolidated mining ditch, } 25 miles long, with laterals amounting to 25 } miles more. } Source of Battle Branch mining ditch.
Amicalola River.....	".....	Dawson.....	
Nimble Will Creek.....	".....	Lumpkin.....	
Two Run Creek.....	".....	".....	
Shoal Creek.....	".....	Dawson.....	
Mill Creek.....	".....	Lumpkin.....	
Camp Creek.....	".....	".....	
Jones Creek.....	".....	".....	
Tallapoosa River.....	".....	Haralson.....	
Little Tallapoosa River.....	".....	Carroll.....	

THE MOBILE BASIN—WATER POWERS

LOCATION OF WATER-POWER	POINT OF SECTION	STAGE	Cubic feet per second	Fall in feet.	Length of shoal	Gross Horse-power	Source of Information	REMARKS
BARTOW COUNTY								
Oothcaloga Creek	Gordon County line	Minimum	15.0	6.00	.....	10.2	Locke	
" "	Adairsville	"	7.0	6.00	.....	4.7	"	
Lewis Spring	Near Adairsville	"	8.0	10.00	.....	9.0	"	
Cedar Spring	Martillo's Mill	"	2.5	18.00	.....	5.0	"	
" Creek	Gordon County line	"	8.0	12.00	.....	11.0	"	
Fork of Pine Log Creek	McCandless & Parrott M.	"	18.0	20.00	.....	41.0	"	
" " "	Johnson's Mill	"	14.0	15.00	.....	23.8	"	
Sallacoa Creek	Gordon County line	"	20.0	20.00	.....	45.4	"	
Stamp Creek	Pool's Furnace	"	12.0	20.00	.....	27.3	"	
" "	At mouth	"	24.0	20.00	.....	54.5	"	
Boston Creek	At mouth	"	4.0	20.00	.....	9.0	"	
Rogers Creek	At mouth	"	7.0	20.00	.....	16.0	"	
Etowah River	At mouth of Allatoona Cr.	Average low water	833.3	15.00	.....	1420.5	10th U. S. Census	
" "	Etowah Mining Co.	Average low water	833.3	80.00	.....	7575.7	"	
Pettis Creek	At mouth	Minimum	20.0	5.00	.....	11.3	Locke	
Nancy's Creek	At mouth	"	6.0	5.00	.....	3.4	"	
Two Run Creek	Kingston	"	26.0	16.00	.....	17.3	"	
Gonaesona Creek	"	"	5.0	20.00	.....	11.3	"	
Bansley's Creek	Near mouth	"	5.0	18.00	.....	10.2	"	
Allatoona Creek	2½ m. from mouth	"	25.5	12.00	.....	49.3	"	
Pumpkinville Creek	2 m. from mouth	"	70.0	10.00	.....	79.5	"	
Raccoon Creek	1 m. from mouth	"	39.0	10.00	.....	44.3	"	
Euharlee Creek	2 m. from mouth	"	120.9	12.00	.....	164.8	"	
CARROLL COUNTY								
Little Tallapoosa River	Above mouth of Buck Cr.	Low spr'g	101.4	10.00	.....	115.1	"	
Buck Creek	Branch of Tallapoosa.	"	16.6	10.00	.....	19.0	"	
Indian Creek	" "	"	7.0	10.00	.....	7.9	"	
Buffalo Creek	" "	"	6.0	10.00	.....	6.8	"	
CHATTAHOOCY COUNTY								
Chattooga River	Trion Factory	Ordinary	163.6	16.00	2¾ m.	303.0	10th U. S. Census	Water-power supplemented by steam for four months.

1 Net horse-power=80 per cent. of gross horse-power.



HURRICANE FALLS, TAITULAH, GA.

CHATHAM COUNTY (Cont.)									
Armuchee Creek	Sublimina	Low spring	41.0	10.00		47.3	D. C. Barrow		
Little Indian Creek	Near mouth	"	5.5	10.00		6.2	"		
Raccoon Creek	Lot 39	"	4.5	10.00		5.1	"		
Rough Creek	At mouth	"	8.8	10.00		10.0	"		
CHEROKEE COUNTY									
Etowah River	Canton	Low water	733.3	6.25	6000	520.0	B. M. Hall	Surveyed Aug. 27, 1890.	
Mill Creek	"	Low spring	45.0				D. C. Barrow		
Etowah River	Franklin Gold Mine	Average low water	663.6	15.00		1136.3	10th U. S. Census	{ Name now changed to Creighton Mine.	
Etowah River	Pahner's Mill	Low water	216.6	10.00		246.2	D. C. Barrow		
Shoal Creek	Hower's Mill	"	33.3	16.00		60.6	"		
Amicalola River	Dawsonville & J. R'd	"	150.0	200.00	17000	3400.0	B. M. Hall	{ This is at Heard's Mill. There are other great falls below and above.	
Amicalola Creek	Part Crane's	Low water	10.0	625.00		710.2	"	Amicalola Falls.	
Nimble Will Creek	Kin Mori Ditch	Ordinary	25.0	300.00		852.2	"	At Kin Mori Mine.	
Shoal Creek Ditch	Near Dawsonville	"	5.0	200.00		113.6	"	Cin. Consolidated Mines.	
FLOYD COUNTY									
Etowah River	Horse Shoe Bend		No measure-	No survey		Said to be large power		Between Rome and Kings-ton.	
Armuchee Creek	Jones's Mill	Ordinary	133.3	10.00		142.3	Locke	Little above low water.	
Little Fork, Armuchee Cr.	Texas Valley	"	41.0	15.00		60.0	"	Echols' Mill.	
Big Fork, " "	White's Bridge	"	48.0				"		
" "	Hammond's Mill	"	48.0	8.00		43.6	"		
John's Creek	Near mouth	"	15.0	8.00		13.6	"		
Silver Creek	"	"	24.0	18.00		49.1	"		
Oedar Creek	Thoman's Mill	Minimum	70.0	10.00		79.5	"		
Little Cedar Creek	Near mouth	"	20.0	14.00		32.7	"		
" "	Cave Springs	Low spring	60.0	10.00		68.2	"		
Big Spring	"	"	8.0				"		
FORSTH COUNTY									
Beaver Run Creek	At mouth	Flush	75.0	20.00		170.4	D. C. Barrow		
Sitting Down Creek	Halbrook's Mill	Low spring	30.0	7.00		23.8	"		
" "	Pool & Heard's	"	30.0	15.00		51.1	"		
GORDON COUNTY									
Oothecala Creek	Calhoun Mills	Low spring	40.0	9.00		40.9	D. C. Barrow		
Connesauga River	At mouth	"	201.6				"	Flat stream.	

THE MOBILE BASIN—WATER-POWERS—Continued

LOCATION OF WATER-POWER	POINT OF SECTION	STAGE	Cubic feet per Second	Fall in feet	Length of Shoal	Gross Horse power ¹	Source of Information	REMARKS
Coosawattee River.....	Carter's Mill.....	Low spr'g	541.0	9.00	.....	562.3	D. C. Barrow.	{ Dam is only 9 ft., but fall is 50 ft. in less than 2 ms.
" ".....	Two miles above Carter's..	"	541.0	50.00	.....	3073.8	"	{ Heavy fall all the way. (No survey.)
" ".....	Ellijay to Carter's.....	"	541.0	.....	17 m.	.....	"	{ Creek has good shoals; no survey has been made.
Talking Rock Creek.....	At mouth.....	"	108.3	.....	.....	.....	"	{ No fall given.
Salacoa Creek.....	Lot 117, 7th Dist., 3d Sec.	"	100.0	.....	.....	.....	"	{ No fall given.
Snake Creek.....	Lot 113, 1st Dist.....	"	14.5	.....	.....	.....	"	{ No fall given.
John's Creek.....	Lot 53, 24th Dist., 3d Sec.	"	12.5	.....	.....	.....	"	{ No fall given.
HABALSON COUNTY								
Tallapoosa River.....	Waldrop's.....	"	50.0	10.00	.....	56.8	"	Ten foot head assumed.
" ".....	McBride's Bridge.....	Flush	583.3	10.00	.....	662.8	"	Ten foot head assumed.
Little River.....	At mouth.....	Ordinary	19.5	10.00	.....	22.1	"	Ten foot head assumed.
Bench Creek.....	Rock House.....	Low wat'r	20.5	30.00	.....	69.30	"	{ A 30-foot dam would flood 70 acres.
Etowah River.....	Five miles of Dahlonega..	"	200.0	20.00	.....	454.5	"	
" ".....	{ Simmon's Mill to Battle Branch Bridge.....			210.00	10 m.		10th U. S. Census	
" ".....	Falls.....			100.00	1/2 m.		B. M. Hall	Near Cooper's Gap Road.
Battle Branch Ditch.....	From Mill Creek.....		3	3300.00		113.6	"	{ Empties into Cane Creek, to increase head and
Etowah Ditch.....	From upper Etowah River..		25.0	20.00	.....	568.1	"	{ Barlow Mill power.
Jones' Creek.....	Lot 234, 5th Dist., 1st Sec.	Low wat'r	5.0	50.00	.....	28.4	D. C. Barrow	
Nimble Will Creek.....	10 miles from Dahlonega..	"	50.0	12.00	.....	68.1	"	
PICKENS COUNTY								
Big Seared Coon Creek...	Fairmount Road.....	"	11.0	10.00	.....	12.5	"	Assumed head.
Talking Rock Creek.....	Federal Road.....	"	13.3	10.00	.....	15.1	"	Assumed head.

¹ Net horse-power = 80 per cent. of gross horse-power.

PICKENS COUNTY—(Con.)										
West Longswamp Creek	Perseverance Quarries	"	21.6	40.00	1 m.	98.4	B. M. Hall	Perseverance Marble Quar's.	{ Surveyed January, 1890. Pelton wheel, 1 mile ditch and 1,500 ft. pipe. Fall about 30 ft. in 1 mile.	
East Longswamp Creek	Southern Marble Co.'s Mill.	"	6.6	50.00	2,000 ft.	94.7	"			
Rocky Creek	"	"	3.6	210.00		87.5	"			
Long Swamp Creek	Georgia Marble Co.	"	46.6				"			
"	Blue Ridge Marble Co.	"	50.7	16.00	3,200 ft.	92.1	"		Surveyed November, 1890.	
POLK COUNTY.										
Euharlee Creek	Rockmart	Low wat'r	25.0	10.00		28.4	D. C. Bar-		Assumed head of 10 feet.	
"	2 miles north of Rockmark.	Low spr'g	19.0	10.00		21.6	row			
"	Hightower's Mill	"	5.4	90.00		55.2	"			
Big Spring	2 miles from Van Wert	"	5.0				"			
Little Cedar Creek	Young's Mill	"	19.3	10.00		20.7	"			
Big Spring	Cedartown	"	9.6				"			
Gut Creek	At mouth	"	26.6	10.00		30.3	"			
PAULDING COUNTY.										
Little Pumpkinvine Creek	16 miles from Marietta	"	10.0	20.00		22.7	Locke		Assumed head.	
Raccoon Creek	Chappel's Store	"	22.0	12.00		30.0	"			Assumed head.
Fork of Dry Creek	One-half mile from mouth.	"	6.5	10.00		7.3	D. C. Bar-			
WALKER COUNTY.										
WHITFIELD COUNTY.										
Swamp Creek	Lot 113		33.3	10.00		37.8	"		{ Assumed head. Assumed head. From mouth of Little R. in Cherokee Co. to W. & A. R.R. bridge in Bartow Co.	
Carpenter Creek	One-half mile So. of Tilton.		11.0	16.00		12.5	"			
Mill Creek	Lot 148, 13th Dist., 3d Sec.		16.0	10.00		18.1	"			
Etowah River	{ For 17 miles above W. & A. bridge	Low wat'r	833.3	102.00	17 m.	9,659.0				
"	Cartersville to Rome	"	1,000.0	154.00	45 m.	17,500.0				

The foregoing gives a very meagre idea of the water powers of this basin. The surveys made by Messrs. Barrow and Locke, Assistant State Geologists, in 1874-'75, were confined mainly to that part of the basin, in which the streams have very few shoals of importance. The great shoals on the Coosawattee, the Cartecay and the Amicalola rivers, and the head streams of the Etowah River have as yet received very little attention.

MOBILE BASIN — UTILIZED POWER.

STREAM	COUNTY	KIND OF MILL	No. of Mills	Total fall used	Total H. P. used	REMARKS.
Tallapoosa River.....	Haralson.....	Flour and grist.....	3	16	67	
" ".....	" ".....	Saw.....	1	7	12	
" ".....	Paulding.....	Flour and grist.....	1	10	10	
Tributaries of Tallapoosa R.	Haralson.....	" ".....	7	71	92	
" ".....	" ".....	Saw.....	1	6	5	
" ".....	Carroll.....	Cotton gin.....	1	6	.....
" ".....	" ".....	Flour and grist.....	10	142	151	
" ".....	" ".....	Saw.....	3	32	36	
" ".....	" ".....	Tannery.....	1	24	6	
" ".....	" ".....	Woolen.....	2	20	9	
Tributaries of Coosa River.	Floyd.....	Flour and grist.....	14	183	204	
" ".....	" ".....	Saw.....	3	37	43	
" ".....	" ".....	Woolen.....	2	15	17	
" ".....	" ".....	Cotton gins.....	2	23	20	
" ".....	Polk.....	Machine shop, etc.....	.....	4	70	
" ".....	" ".....	Flour and grist.....	6	125	138	
" ".....	" ".....	{ Flour and grist, saw and } tannery.	.....	18	58	
Etowah River.....	Dawson.....	Stamp mill.....	1	83	50	
" ".....	" ".....	Flour and Grist.....	4	42	27	
" ".....	" ".....	Saw.....	2	30	40	
Tributaries of Etowah R.	Polk.....	Flour and grist.....	2	16	47	
" ".....	Floyd.....	" ".....	2	156	318	
" ".....	Bartow.....	" ".....	14	107	79	
" ".....	Paulding.....	" ".....	2	24	34	
" ".....	" ".....	Saw.....	2	12	4	
" ".....	" ".....	Woolen.....	1	26	26	
" ".....	Cobb.....	Flour and grist.....	2	195	187	
" ".....	Cherokee.....	" ".....	12	25	36	
" ".....	" ".....	Cotton gins.....	2	73	64	
" ".....	" ".....	Saw.....	5	54	50	
" ".....	Pickens.....	" ".....	2	15	20	
" ".....	" ".....	Furniture.....	2	.....	.....

Cedartown.

APALACHICOLA BASIN—IMPORTANT STREAMS

NAME OF STREAM	TRIBUTARY TO	COUNTY	REMARKS
Chattahoochee River.....	Apalachicola River.....	Muscogee.....	Large shoal on creek 2 m. from mouth.
Standing Bay Creek.....	Chattahoochee ".....	Harris.....	Large cr.; falls 60 ft. in quarter of mile.
Mulberry Creek.....	".....	".....	60 cu. ft. per sec.; 20 ft. fall on shoal at River Road.
Mountain Creek.....	".....	".....	{ Troup Factory, 80 cu. ft. per sec.; 18 ft. fall, low
Old House Creek.....	".....	Harris and Troup.....	water. (Locke)
Flat Shoals.....	".....	".....	{ 5½ m. from LaGrange; 7 cu. ft. per sec.; 10 ft.
Muddy Creek.....	".....	Troup.....	fall, low water. (Locke)
Yellow Jacket Creek.....	".....	".....	{ 8½ m. from LaGrange; 87 cu. ft. per sec.; 10 ft.
Peach Creek.....	Yellow Jacket Creek.....	".....	fall, low water. (Locke)
Panther Creek.....	Chattahoochee River.....	".....	{ 5 m. from LaGrange; 35 cu. ft. per sec.; 15 ft.
Flat Creek.....	".....	".....	fall; low water. (Locke)
New River.....	".....	Heard and Coweta.....	{ 3 m. from LaGrange; 25 cu. ft. per sec.; 10 ft.
Whittaker Creek.....	".....	Heard.....	{ Gorham's Mill; 20 cu. ft. per sec.; 12 ft. fall, low
Hillabatchee Creek.....	".....	".....	water. (Locke)
Centrallatchee Creek.....	".....	".....	{ ¼ m. of mouth; 133.3 cu. ft. per sec.; 10 ft. fall
Wahoo Creek.....	".....	Coweta.....	{ low spring. (Locke)
Cedar Creek.....	".....	".....	{ Whitaker's Mill; 91 cu. ft. per sec.; 30 ft. fall.
Snake Creek.....	".....	".....	{ (C. C. Anderson)
Dog River.....	".....	".....	{ 57.9 cu. ft. per sec.; 8 ft. fall, saw mill.
Bear Creek.....	".....	".....	{ (C. C. Anderson)
Camp Creek.....	".....	".....	{ At Sergeant's; 41.4 cu. ft. per sec. at mean low
			water. Fall 33 ft. in 1,600. (C. C. Anderson)
			{ Cotton factory and grist mill.
			{ 2.6 cu. ft. per sec, 14 ft. fall=³ H. P. per foot of
			fall. (C. C. Anderson)
			{ Above Watkins' mill; 25 cu. feet per second, low
			spring. (Locke)
			{ 52.5 cu. ft. per sec. (C. C. Anderson.)
			{ Campbell.....

Sweet Water Creek	"	{ Paulding, Cobb and } Douglas.	{ Austell Shoals, near mouth, has 80 feet of fall and 166.9 cu. ft. per sec. Hayes bridge, 80 cu. ft. per sec., low water. (Locke.)
Powder Springs Creek	Sweet Water Creek	Cobb.	{ Powder Springs; 34 cu. ft. per sec., low water. (Locke.)
Nose's Creek	"	"	{ Paper mill; 62 cu. ft. per sec.; 67 ft. head, low spring. (Locke.)
Soap Creek	Chattahoochee River	"	{ 29 ft. fall at Ruff's Mill, and 21 ft. at Concord Factory.
Utoy Creek	"	Fulton.	{ Houston's Mill; 23.3 cu. ft. per sec.; 22 ft. fall, low water. (Locke.)
Nickajack Creek	"	Cobb.	{ Buckhead Road, 97 cu. ft. per sec., flush. (Locke.)
Peachtree Creek	"	Fulton and DeKalb	{ Lot 36, 17th Dist.; 45 cu. ft. per sec., low spring. (Locke.)
Nancy's Creek	Peachtree Creek	"	{ 12 cu. ft. per sec. = 1.27 gross H. P. per ft. of fall; Measured July 28, 1892, by B. M. Hall.
Rottenwood Creek	Chattahoochee River	Cobb.	{ Lot 164, 17th Dist., 6.5 cu. ft. per sec. (Locke.)
Long Island Creek	"	Fulton.	{ Wright's Mill; 16.6 cu. ft. per sec.; 23 ft. fall, ordinary stage; gross H. P. = 43.
Willis Creek	"	Cobb.	{ 3 factories at Roswell; total fall, 103 ft., volume about 50 cu. ft. per sec. (C. C. Anderson.)
Vickery's Creek	"	Forsyth, Milton and Cobb.	{ Lawrenceville and Buford road; 11.6 cu. ft. per sec. (Locke.)
Suwanee Creek	"	Gwinnett	{ Hamilton's Mill; 2 cu. ft. per sec., 18 ft. fall, low water. (Locke.)
Ivy Creek	Suwanee Creek	"	{ Important gold mining stream, with many fine undeveloped powers not surveyed.
Chestatee River	Chattahoochee River	{ Lumpkin, Dawson, Forsyth and Hall.	{ Ditch, 7 miles long, diverts Etowah waters across ridge into Cane Creek; 25 cu. ft. per sec., with a head of 200 ft. = 568 gross H. P.; not utilized.
Etowah Ditch, entering Cane Creek	Chestatee River	Lumpkin.	{ At Cane Cr'k falls, 16.6 cu. ft. per sec.; 60 ft. fall.
Cane Creek	"	"	{ At Barlow gold mill, 40 cu. ft. per sec.
Clay Creek	Cane Creek	Lumpkin.	{ Has a good shoal.
Yahoola Creek	Chestatee River	"	{ Source of Hand Mining Ditch, 35 miles long; furnishes water to many mines for hydraulic mining. The ditch carries from 16 to 25 cu. ft. per sec.; and is 300 ft. above streams near Dahlonega.

APALACHICOLA BASIN -IMPORTANT STREAMS—Continued

NAME OF STREAM.	TRIBUTARY TO	COUNTY	REMARKS
Cavender's Creek	Chestatee River.....	Lumpkin.....	{ Drains an important gold-mining region of Lumpkin county.
Yellow Creek	"	Hall	{ 7.2 cu. ft. per sec.; 20 ft. shoal near mouth. (Barrow.)
Tessantee River.....	"	White	{ 95 cu. ft. per sec.; big shoal near mouth.
Shoal Creek	Tessantee River.....	"	{ Has Asbury's Mill and other good shoals.
Town Creek.....	"	"	{ Source of Loud Ditch, 25 miles long, used for hydraulic mining.
Jennie's Creek	Town Creek.....	"	{ }
Tate's Creek	Chestatee River.....	Lumpkin.....	{ To furnish water for proposed Cavender's Creek Ditch.
Mill Creek	"	"	{ To furnish water for proposed Cavender's Creek Ditch.
Dick's Creek	"	"	{ Large creek; falls over 100 feet to the mile.
Turner's Creek	"	White.....	{ }
Little R. from Wahoo Cr.	Chattahoochee River.....	Hall	{ Castleberry's Mill, 4 miles from Gainesville; 151.5 cu. ft. per sec.; 71 ft. fall; gross H. P., 122; 25 H. P. used. (C. C. Anderson.)
Glade Creek	"	"	{ Furnishes water and drainage to "The Glades" Gold Mine.
Flat Creek	"	"	{ 13.6 cu. ft. per sec.; 50 ft. fall; shoal above "The Glades" Mine.
Mud Creek	"	Habersham	{ Big Mud Creek, 33.3 cu. ft. per sec.; Little Mud Creek, 20 cu. ft. per sec.
Sagehen River	"	"	{ See Power Table.
Flazed Creek	Sagehen River	"	{ Lake and water-power at Demorest.
Deep Creek	"	"	{ 38.3 cu. ft. per sec. at mouth. (Barrow and Locke.)
Shoal Creek	"	"	{ 16.6 cu. ft. per sec. at mouth. (B. M. Hall, estimated)
Mossy Creek	Chattahoochee River.....	White.....	{ }
Duke's Creek, North Fork	"	"	{ Duke's Creek Falls, 12.8 cu. ft. per sec.; 300 ft. fall. (Barrow)
"	"	"	{ Minnehaha Falls, 3.6 cu. ft. per sec.; 300 ft. fall. (Barrow)
Smith's Creek.....	"	"	{ Annie Ruby Falls, 7.1 cu. ft. per sec.; 300 ft. fall. (Barrow)



NATURAL DAM, BIG POTATO CREEK, UISON COUNTY.

		{ Large Creek with fine undeveloped power, enough for running 100,000 spindles. (U. S. Govern- ment Report)	
Flint River.....	Apalachicola River {	Webster, Sumter, Terrell.	
Kinchafoone Creek.....	Flint River.....		
Buck's Creek.....	" "	Macon.....	
Whitewater Creek.....	" "	Macon and Taylor.....	
Cedar Creek.....	Whitewater Creek.....	Taylor.....	
Parchelagoe Creek.....	Flint River.....	"	
Spring Creek.....	" "	Crawford.....	
Little Potato Creek.....	" "	Upson.....	
Big Potato Creek.....	" "	Upson and Pike.....	
Wasp Creek.....	Big Potato Creek.....	Pike.....	
Grape Creek.....	" "	"	
Laxer Creek.....	Flint River.....	Talbot.....	
Pigeon Creek.....	" "	Meriwether and Talbot.....	
Cane Creek.....	" "	Meriwether.....	
Red Oak Creek.....	" "	"	
Elkin's Creek.....	" "	Pike.....	
Line Creek.....	" "	Coweta and Fayette.....	
Whitewater Creek.....	Line Creek.....	Fayette.....	

APALACHICOLA BASIN — WATER POWERS

Utilized Net H. P.	LOCATION OF WATER- POWER	POINT OF SECTION	Stage of Water	Cubic ft. per Second	Fall in feet	Length of Shoal	Gross H. P. ¹	Source of Informa- tion	REMARKS
60	SOQUEE RIVER	Clarkesville Woolen Mill	0.0	266.6	26.0	1,000'	738.6	{ C. C. An- derson.	Only 18 ft. used.
100	"	Porter Mills, Shoal No. 1	"	266.6	14.4	100'	436.3	"	{ See fluctuation tables: 0.0=min. observed wa- ters.
150	"	Porter Mills, Shoal No. 2	"	291.6	45.2	1,400'	1,369.0	"	
None	"	Porter Mills, Shoal No. 3	"	.....	15.0	1,200'	497.0	"	
	CHATTahoochee RIVER								
Corn Mill	White County	Nicholls' Mill	Min. L.W.	72.0	10.0	.....	81.8	{ Barrow & Locke	
None	White & Habersham Cos	Duncan Shoal	0.0	683.3	7.6	400'	589.2	{ C. C. An- derson.	{ Includes Soquee River at mouth.
"	"	Carpenter Shoal	"	683.3	3.2	400'	248.4	"	{ Below mouth of Soquee.
"	"	Johanny's Ford Shoal	"	683.3	5.4	1,200'	419.3	"	
"	"	Gearing Shoal	"	683.3	1.3	300'	101.0	"	
"	"	Fishtrap Shoal	"	683.3	1.8	300'	138.8	"	
"	"	Bull Shoal	"	683.3	7.0	1,800'	543.5	"	{ Foot, 3 miles below mouth of Soquee.
"	"	Last Six Shoals, total	"	683.3	38.0	13,200'	2,950.7	"	{ Can be developed as one power.
"	"	Rock House Shoal	"	750.0	3.7	900'	315.3	"	
"	"	Mountain Island Shoal	"	766.6	7.3	1,800'	635.8	"	
"	"	Lulu Bridge	"	783.3	2.0	1,200'	178.0	"	
"	Hall County	Reynolds	"	800.0	6.0	1,200'	545.4	"	
"	"	Seven Islands	"	816.6	4.0	.....	371.2	"	
"	"	Savage Shoal No. 1	"	833.3	1.0	1,200'	94.7	"	
"	"	Savage Shoal No. 2	"	833.3	2.5	1,200'	236.7	"	
"	"	Peg's Shoal	"	833.3	6.3	2,530'	596.0	"	
"	"	Stringer's Ford	"	833.3	10.0	1,200'	947.0	"	
"	"	Wilson Shoal	"	933.3	6.5	2,500'	689.4	"	
"	"	Thompson's Bridge	"	933.3	.....	.....	.....	"

¹ Net H. P. = 80 per cent. of gross H. P.

[illegible]

^a These three shoals form one continuous shoal four miles long with a fall of fifty feet.

² Known as the Vining Shoal, being near Vining Station on W. & A. R. R.

APALACHICOLA BASIN—WATER-POWERS—Continued

Utilized Net H. P.	LOCATION OF WATER-POWER	POINT OF SECTION	Stage of Water.	Cubic Feet per Second	Fall in Feet	Length of Shoal	Gross H. P. ¹	Source of Informa- tion	REMARKS
None	Heard County	Jackson Shoal	0.0	3,036.6	6.7	3,000'	2,296.7	Anderson	
"	"	Seven small Shoals	"	3,333.3	13.0	.....	4,924.0	"	
"	Troup County	Swanson Shoal	"	3,500.0	7.0	1,500'	2,784.0	"	
"	"	Small Shoals	"	3,750.0	3.5	.....	1,491.5	"	
"	"	McGees' Bridge	"	4,000.0	8.3	3,000'	3,772.7	"	Three Shoals.
"	"	Buzzard and Reed Isl'd.	"	4,166.6	8.3	3,000'	3,930.0	"	
"	"	Bentley's Mill	"	4,166.6	4.0	.....	1,894.0	"	
"	"	Ferrell or Huguley's	"	4,666.6	9.0	.....	4,772.7	"	3 or four miles above W. P.
"	"	Pott's Shoal	"	4,933.3	5.0	3,600'	2,803.0	"	
"	"	West Point	"	4,933.3	.....	.....	.....	"
300 H.P.	Harris County	Jack Todd's Shoal	"	4,933.3	51.0	39,600'	28,591.0	U. S. Sur.	{ Two cotton mills, four miles below W. P. Vol. from C. C. Anderson.
None	"	3 m. below Houston's F'y	"	4,933.3	4.0	1,100'	2,242.0	"	"
"	"	Hargett's Island Shoal	"	5,000.0	60.0	13,000'	34,991.0	"	"
"	"	"	"	5,000.0	15.0	4,000'	8,522.7	"	"
"	"	"	"	5,000.0	26.0	8,700'	14,772.0	"	"
"	"	Tate Shoals	"	5,000.0	22.0	6,300'	12,530.0	"	"
"	"	Mulberry Shoals	"	5,166.6	30.0	10,560'	17,613.0	"	"
"	"	Near mouth of Standing Bay Creek }	"	5,216.6	10.0	3,800'	5,928.0	"	"
"	At Columbus	Chattahoochee Falls Prop.	"	5,216.6	42.0	6,900'	24,715.0	"	"
"	"	Lover's Leap	"	5,216.6	37.0	2,600'	21,933.0	"	"
"	"	City Mills	"	5,216.6	10.0	Dam	5,928.0	"	"
"	"	Eagle and Phoenix Mills	"	5,216.6	25.0	"	14,820.0	"	"
"	Hall, Bartow, Muscogee and intervening counties								
"	Continuous level from) Thompson's Bridge. }	to W. & A. R'y Bridge	"	.....	227.0	73 miles	.....	"	{ 3 ms. N. of Gainesville to 6 ms. W. of Atlanta.
"	From W. & A. R'y Bridge to West Point.		"	.....	162.0	108 mls.	.....	"	{ 6 ms. W. of Atlanta to West Point.
"	From West Point to Columbus		"	.....	362.0	34 mls.	.....	"	West Point to Columbus.

¹ Net horse-power=80 per cent. of gross horse-power.

	SWEETWATER CREEK.	Austell Shoals	Low W'r	166.6	80.0	3,900'	1,515.0	B. M. Hall	{ Near Austell, Ga. Easily developed.
	Douglas County								
	CHESTNUT RIVER.								
	Lumpkin County	Garnet Mine	"	Unk'n	15.0	1,200'	Unk'n	"	{ Dam, race, stamp-mill and pumps.
	"	Chestatee Pyrites Co.	"	"	20.0			"	
	"	Penitentiary Shoal	"	"	L'rge.	Unk'n	"	"	
	"	Chestatee Mining Co.	"	"	Unk'n	"	"	"	
	"	Cathoun Mine	"	"	12.0	Dam	"	"	{ Power developed. { Dam, stamp-mill and pump.
	"	Leather's Ford	"	260.0	12.0	Unk'n	395.0	Barrow	
	FLINT RIVER.								
30 H. P.	Meriwether and Pike Cos.	Sullivan's Mill	0.0	250.0	7.3	200'	207.0	Anderson	{ Grist mill. { A four-foot storage- dam will develop 2,630 gross 10-hour H. P., 6 days per week, at low- est water.
40 "	"	Flat Shoals	Min. L.W.	258.3	32.0	3,000'	934.0	B. M. Hall	
	"	"							
	Upson County	Dripping Rock	Normal.	856.6	32.0	3,000'	3,114.0	Anderson	
	"	Yellow Jacket Shoals	Flush.	1,674.1	14.0	2,900'		"	
	"	Shipe's Shoals	Normal.	1,216.2	36.6	3,400'			
	"	"	Flush.	2,607.6	7.0	1,800'		Anderson	{ Water too high for meas- urement.
	BIG POTATO CREEK.								
None	Upson County	Rogers' Shoals	Low W'r	103.3	81.0	3,500'	951.0	"	
30 H. P.	"	Nelson's Shoals	0.0	110.0	115.0	2,700'	1,437.0	"	
20 "	"	Daniel's Mill	"	110.0	13.0	150'	162.0	"	
	CHATTahoochee CO.								
	Oswatchee Creek	Romney's Mill	Low Sp'g	21.0	18.0		42.0	Locke	{ 1st drop is 60 ft. in a dis- tance of 500 ft., making 750 gross H. P.
	Woolfolk's Branch	Woolfolk's	"	1.0	65.0		7.0	"	
	CLAY COUNTY.								
	Chemochechole Creek	Weaver's Mill	"	60.0	30.0		204.0	Barrow	
	Pataula Creek	Rapids	"	240.0	22.0		600.0	"	

APALACHICOLA BASIN—WATER-POWERS—Continued

Utilized Net H. P.	LOCATION OF WATER- POWER.	POINT OF SECTION.	Stage of Water.	Cubic Feet per Second.	Fall in Feet.	Length of Shoal.	Gross H. P. ¹	Source of Informa- tion.	REMARKS.
	DECATUR COUNTY.								
	Limesink Creek.....	Limesink.....	Low Sp'g	2.0	105.0	.....	23.0	Locke.	Creek disappears.
	Barnett's Creek.....	Lot 367.....	"	23.0	10.0	.....	26.0	"	{ Flow affected by mills
	Attapulgus Creek.....	Thomasville Road.....	"	18.0	.....	.....	.....	"	{ above.
	Saburn's Creek.....	Attapulgus Road.....	"	8.0	.....	.....	.....	"
	EARLY COUNTY.								
	Harrell's Creek.....	Early Factory.....	"	20.0	35.0	.....	80.0	"	
	Colomachee Creek.....	Early Road.....	"	70.0	12.0	.....	95.0	"	
	QUETMAN COUNTY.								
	Hodlarnes Creek.....	Near Mouth.....	Low Wr	6.0	10.0	.....	7.0	"	
	Tobehannee Creek.....	" Georgetown.....	"	10.0	10.0	.....	11.0	"	
	RANDOLPH COUNTY.								
	Rearing Branch.....	5 miles from Ft. Gaines.	"	4.0	30.0	.....	14.0	"	
	Wakefort-see Creek.....	Near Chemocheebee.	"	5.0	10.0	.....	5.0	"	
	STEWART COUNTY.								
	Wimberly's Branch.....	Gaines & Freeman's Mill	"	8.8	12.0	.....	12.0	"	
	Holcadake Creek.....	Scott's Mill.....	"	12.0	10.0	.....	14.0	"	

Many important water-powers are omitted in the Apalachicola Basin for want of data. The foregoing is the best that can be done until more surveys are made. Investigation is especially needed on the Flint River and its upper tributaries.

¹ Net H. P. = 80 per cent. of gross H. P.

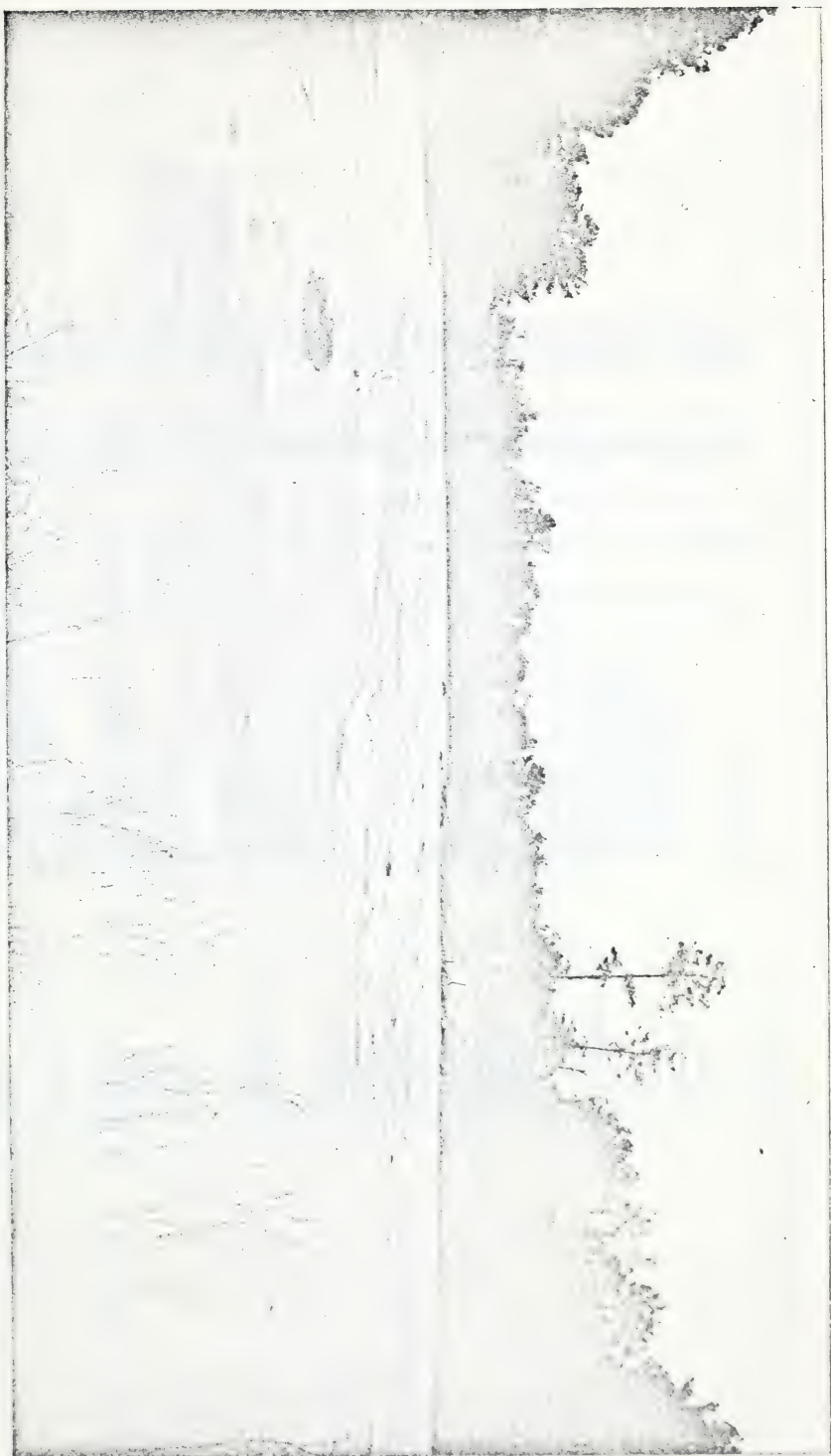
APALACHICOLA BASIN — UTILIZED POWER.

STREAM	COUNTY	KIND OF MILL	No. of Mills	Total Fall Used, in Feet	Total Net H.P. Used	REMARKS
Chattahoochee River.....	Muscookee.....	Cotton Factories.....	8	43	2,000	
"	"	Flour and Grist.....	1	8	100	
"	Harris.....	"	1	8	50	
"	"	Cotton Factory.....	1	8	160	
"	Troup.....	"	1	9	130	
"	Hall.....	Building Material.....	1	9	30	
"	"	Flour and Grist.....	1	9	60	
"	Cobb.....	"	1	11	10	
"	"	"	6	56	72	
Tributaries of Chattahoochee River.....	"	"	1	29	25	
"	"	Sawmill.....	1	29	60	
"	Clay.....	"	3	8	6	
"	"	Cotton Gin.....	1	8	77	
"	"	Flour and Grist.....	6	58	96	
"	Quitman.....	"	4	49	63	
"	"	Sawmill.....	2	24	8	
"	"	Flour and Grist.....	1	9	192	
"	Randolph.....	"	8	83	22	
"	Stewart.....	"	2	20	15	
"	"	Sawmill.....	1	57	75	
"	Chattahoochee.....	"	6	73	213	
"	"	Flour and Grist.....	4	6	12	
"	Muscookee.....	"	1	8	21	
"	Marion.....	Cotton Gin.....	1	8	30	
"	"	Sawmill.....	1	12	10	
"	"	"	1	12	398	
"	Harris.....	Flour and Grist.....	13	285	47	
"	"	"	2	36	43	
"	Talbot.....	"	2	36	65	
"	"	Sawmill.....	4	57	8	
"	Troup.....	Tannery.....	1	22	506	
"	"	Flour and Grist.....	22	223	60	
"	"	"	1	20		

APALACHICOLA BASIN — UTILIZED POWER — Continued

STREAM	COUNTY	KIND OF MILL	No. of MILLS.	Total Fall Used, in Feet	Total Net H.P. Used	REMARKS
Tributaries of Chattahoochee River						
"	Meriwether	Flour and Grist	1	30	11	
"	"	"	8	91	101	
"	"	Sawmill	3	124	125	
"	Carroll	Cotton	1	30	120	
"	"	Flour and Grist	12	277	160	
"	"	Sawmill	3	58	26	
"	Coweta	Cotton	1	.....	60	
"	"	Flour and Grist	14	275	226	
"	Campbell	"	7	124	139	
"	Douglas	Cotton Gin	1	11	20	
"	"	Flour and Grist	13	202	119	
"	"	Sawmill	6	136	82	
"	"	Tannery	1	60	10	
"	"	Cotton	1	.....	60	
"	"	Woolen-mill	1	14	9	
"	Paulding	Flour and Grist	2	13	60	
"	"	Sawmill	1	20	8	
"	Cobb	Cotton	3	67	375	
"	"	Woolen-mill	2	40	85	
"	"	Cotton Gins	9	135	111	
"	"	Flour and Grist	23	368	454	
"	"	Paper-mill	1	22	75	
"	"	Sawmill	5	45	69	
"	Fulton	"	3	30	31	
"	"	Cotton Gins	3	20	22	
"	"	Flour and Grist	8	157	103	
"	DeKalb	"	7	120	119	
"	"	Furniture	2	47	25	
"	"	Tannery	1	15	10	
"	"	Sawmill	2	24	40	
"	"	"	4	47	44	
"	Gwinnett	Flour and Grist	9	116	98	

FLAT SHOALS ON THE FLINT RIVER, MERIWETHER COUNTY.



Flint River	"	Forsyth	"	"	Sawmill	8	154	187	
"	"	"	"	"	"	4	54	36	
"	"	Hall	"	"	Carriages and wagons	4	45	90	
"	"	"	"	"	Flour and Grist	1	22	15	
"	"	"	"	"	"	11	151	175	
"	"	Milton	"	"	"	4	68	82	
"	"	"	"	"	Sawmill	22	28	32	
"	"	Fannin	"	"	"	7	141	75	
"	"	"	"	"	Flour and Grist	10	183	134	
"	"	"	"	"	Tannery	1	20	4	
"	"	"	"	"	Gold Mills	3	35	700 ¹	Chestatee River.
"	"	"	"	"	"	3	40	280 ¹	Yahoola Creek.
"	"	"	"	"	"	8	16	40 ¹	Cane Creek.
"	"	"	"	"	"	1	300	600 ¹	Yahoola Ditch.
"	"	Habersham	"	"	Hydraulic Mining				
"	"	"	"	"	Flour and Grist	1	14	10	
"	"	"	"	"	Leather	1	16	6	
"	"	"	"	"	Woolen-mill	1	20	12	
"	"	White	"	"	Flour and Grist	1	10	15	
"	"	Campbell	"	"	"	1	14	28	
"	"	Clayton	"	"	"	5	90	44	
"	"	Fayette	"	"	"	1	13	12	
"	"	Campbell	"	"	"	8	70	50	
"	"	Clayton	"	"	"	8	148	135	
"	"	"	"	"	Sawmill	1	22	15	
"	"	Henry	"	"	Flour and Grist	1	18	15	
"	"	Spalding	"	"	"	2	13	40	
"	"	Fayette	"	"	"	5	46	109	
"	"	Coweta	"	"	"	4	71	88	
"	"	"	"	"	Sawmill	1	5	12	
"	"	"	"	"	Tannery	1	30	16	
"	"	Meriwether	"	"	Flour and Grist	11	171	138	
"	"	"	"	"	Sawmill	1	16	15	
"	"	Pike	"	"	Wheelwrighting	1	8	12	
"	"	"	"	"	Flour and Grist	11	154	276	
"	"	Crawford	"	"	"	3	25	43	
"	"	Upson	"	"	"	13	191	373	
"	"	"	"	"	Cotton	2	29	115	
"	"	"	"	"	Sawmill	5	72	402	

¹ Power estimated by B. M. Hall.

APALACHICOLA BASIN -- UTILIZED POWER -- Continued

STREAM.	COUNTY	KIND OF MILL	No. of Mills	Total Fall Used, in Feet		Total net H. P. Used	REMARKS
				Used,	in Feet		
Tributaries of Flint River	Upson	Tannery	1	10		5	
"	Talbot	Flouring and Grist.	9	214		169	
"	Taylor	Cotton.	1	12		40	
"	Marion	Sawmill	1	12		20	
"	"	Flouring and Grist.	4	33		52	
"	Taylor	"	10	84		129	
"	"	Sawmill.	6	58		95	
"	Schley	Flouring and Grist.	6	53		70	
"	Macon	"	5	51		102	
"	"	Sawmill	1	8		30	
"	Dooley	"	2	14		15	
"	"	Flouring and Grist.	2	8		30	
"	Sumter	"	7	51		99	
"	Lee	"	4	22		41	
"	Webster	"	8	66		107	
"	"	Sawmill	3	28		33	
"	Randolph	Flouring and Grist.	6	69		84	
"	Terrell	Sawmill.	2	11		30	
"	"	Flouring and Grist.	2	14		15	
"	Calhoun	"	3	10		50	
"	"	Sawmill.	1	6		12	
"	Dougherty	Flouring and Grist.	1	12		40	
"	"	Sawmill.	1			20	
"	Worth	"	1	10		20	
"	"	Flouring and Grist.	3	25		23	
"	Early	Cotton	1	40		45	
"	"	Flouring and Grist.	5	57		62	
"	"	Sawmill	1	9		10	
"	Miller	"	1	8		12	
"	"	Flouring and Grist	1	8		40	
"	Baker	"	3	14		45	
"	Decatur	"	1	5		8	

ALTAMAHIA BASIN — IMPORTANT STREAMS
 OCNULGEE RIVER

STREAM	TRIBUTARY TO	COUNTY	REMARKS
Ocnulgee.	Altamaha River.	Houston.	{ Cotton factory; 12 ft. fall; estimated 120 H. P. (U. S. Census.) }
Mossy Creek	Indian Creek.	"	
Indian Creek	Ocnulgee River.	Bibb	{ 8 miles from Macon; 8 cu. ft. per sec.; 12 ft. fall, low water. (Locke.) }
Stone Creek	"	Monroe and Crawford	Has several grist and sawmills. (U. S. Census.)
Tchacoonnee Creek	"	Twiggs and Bibb	
Snake Creek	"	Bibb, Monroe and Crawford.	{ Freeman's Mill; 70 cu. ft. per sec.; 20 ft. fall, nor- mal water. (Locke.) }
Tolosokee Creek	"	Jones and Bibb	{ Macon; 5 cu. ft. per sec.; 10 ft. fall, low water. (Locke.) }
Walnut Creek	"	Jones	
Falling Creek	"	Monroe	
Run Creek	"	Henry, Butts and Monroe	{ High falls; see Power Table. Has other shoals above, and Willis Shoals nearer mouth; 10 ft. fall. Has two mills; one of them has 27 ft. head. (10th U. S. Census.) }
Towaliga River	"	Monroe	
South Towaliga River.	Towaliga River.	Henry	
Towaliga Creek	"	Henry and Butts	
Tusshaw Creek	Ocnulgee River.	Newton and Walton	
Alcovy River	"	Walton	
Cornish Creek	Alcovy River.	"	
Big Flat Creek	"	Newton.	
Pear Creek	"	Newton	
South River.	Ocnulgee River.	Newton	
Wildcat Creek	South River.	"	
Sawd Creek	"	Henry	
Walnut Creek.	"	"	{ Has several mills and sites, and is a good stream in dry weather. (10th U. S. Census.) }
Cotton river	"	"	{ At Mitchell's mill, 20 cu. ft. per sec.; low water (Probel.) }
Sharp Finger Creek	South River.	DeKalb	

ALTAHAMA BASIN — IMPORTANT STREAMS — *Continued*

STREAM	TRIBUTARY TO	COUNTY	REMARKS
Pole Bridge Creek	South River	Rockdale	14.6 cu. ft. per sec.; extreme low water. (Frobel.)
Honey Creek	"	"	14.3 cu. ft. per sec.; extreme low water. (Frobel.)
Yellow River	Ocmulgee River	Newton, Rockdale, Gwinnett	{ Six miles above Rockdale Paper Mill is Baker's Mill, with 9 or 10 ft. fall, and 4 grist mills above it. (10th U. S. Census.)
Big Haynes Creek	Yellow River	"	{ Principal tributary of Yellow River. Has many available powers, and is a fine stream in all respects. (10th U. S. Census.)
Little Haynes Creek	Big Haynes Creek	"	
Ocmulgee RIVER			
Ogee River	Altamaha River	Wilkinson and Twiggs	{ Drainage area, 284 sq. miles. Myrick's Mill, 8 ft. fall. (Locke.)
Big Sandy Creek	Ogee River	Jones and Wilkinson	Drainage area, 196 sq. miles.
Cocumescum Creek	"	Washington	Drainage area, 286 sq. miles.
Bullock Creek	"	"	Drainage area, 375 sq. miles.
Palmetto Creek	"	"	{ Falls 62 ft. on five shoals in 12 miles. The largest single shoal is at Old Factory in Putnam county, 25 ft. in 900 feet.
Little River	"	Morgan and Putnam	Three miles from mouth; 18 ft. fall in 600 ft.
Chalco Creek	Little River	Jasper, Jones and Baldwin	
Winder Creek	"	Jasper and Putnam	
Putnam Creek	"	Morgan and Putnam	
Crooked Creek	Ogee River	Putnam	
Shoalwater Creek	"	Hancock	
Sugar Creek	"	Morgan	
Apalachicola River	"	{ Gwinnett, Walton, } Morgan and Morgan }	{ No surveys of the good powers of this river in Gwinnett and Walton counties have been made. Has a shoal 3 miles from its mouth; 10 ft. fall. Has a shoal 2 miles long, 8 miles from Madison.
Hard Labor Creek	Apalachicola River	"	
Sandy Creek	Hard Labor Creek	Walton	
Small Creek	Apalachicola River	"	
Middle Ogee River	Ogee River	Clarke, Jackson and Hall	

Barber's Creek	Mid. Oconee River	Oconee and Clarke	{ 20 ft. in 900 ft.; 24 ft. in 180 ft.; and 20 ft. in 600 ft.; all in 3 miles, near mouth; 20 ft. utilized for paper-mill.
Mulberry Fork	Mid. Oconee River	Jackson	Good stream for power. No surveys.
North Oconee River	Oconee River	Clarke, Jackson and Hall	
Big Sandy Creek	North Oconee River	Jackson and Clarke	{ Harrington's Ford, 15.5 cu. ft. per sec.; 20 ft. fall. (Barrow.) County line; 22.5 cu. ft. per sec.; 10 ft. fall. (Barrow) Mangum's mill; 10.5 cu. ft. per sec.; 9 ft. fall. (Barrow) Near Jefferson; 8 cu. ft. per sec.; 18 ft. fall. (Barrow)
Walnut Fork	"	Hall	
Allen's Fork	"	"	
Pond Fork	"	"	
Curry's Creek	"	Jackson	

ALTAMAHA BASIN—WATER-POWERS

OCMULGEE RIVER

Utilized Power	LOCATION OF POWER	POINT OF SECTION	Stage of Water	Cubic Feet per Second	Fall in Feet	Length of Shoal in Feet	Gross H. P. ¹	Source of Information	REMARKS
	YELLOW RIVER								
	Gwinnett County.....	Pain's Mill.....	Low Spr	10.0	20.0	.....	136	{ Barrow	
	" ".....	Steadman's Mill.....	"	64.0	30.0	.....	218	{ "	
	Rockdale County.....	Rockdals Paper-mill.....	Normal	266.6	46.0	3,365	1,394	{ R. M. Hall	
	" ".....	Glenn Shoal.....	"	283.3	12.0	.....	386	{ 10th U.S.	
	Newton County.....	Bridge Shoal.....		500.0	4.4	.....	250	{ Census	{ Volume estimated.
	" ".....	Cedar Shoals.....		515.4	55.0	2,700	3,221	{ Frobels	{ Volume from C. G. Anderson.
	" ".....	Dried Indian Shoal.....		515.4	7.0	1,500	410	{ U.S.A.E.	{ son.
	" ".....	Indian Fishery.....	Low Wt	.....	12.7	525	764	{ Anderson	{ Porterdale Factory,
S H. P.	SOUTH RIVER								{ 3 m. form Covington.
	Utilized DeKalb County.....	Flat Shoals.....	"	74.0	24.0	.....	202	{ Frobels	{ Cotton Gin.
	" ".....	Albert Shoal.....	"	.....	18.0	.....	.....	{ 10th U.S.	{ Cotton Factory of the
	Utilized Henry County.....	McKnight's Mill.....	"	93.0	12.0	.....	126	{ Census	{ Oglethorpe Mfg. Co.
	" ".....	Peachstone Shoal.....	"	120.0	12.0	.....	163	{ Frobels	{ Not utilized.
	Newton County.....	Snapping Shoal.....	Flush	617.1	20.0	775	.....	"	{ 12 ft. head utilized;
	" ".....	Island Shoal.....	Low Wt	475.0	16.0	750	863	{ Anderson	{ 20 ft. head available.
	" ".....	Mann's Bridge.....	"	488.3	10.0	3,000	555	"	{ 28 ft. fall in 1,500 ft.
None.									{ (C. G. Anderson.)

¹ Net H. P. 50% of Gross H. P.

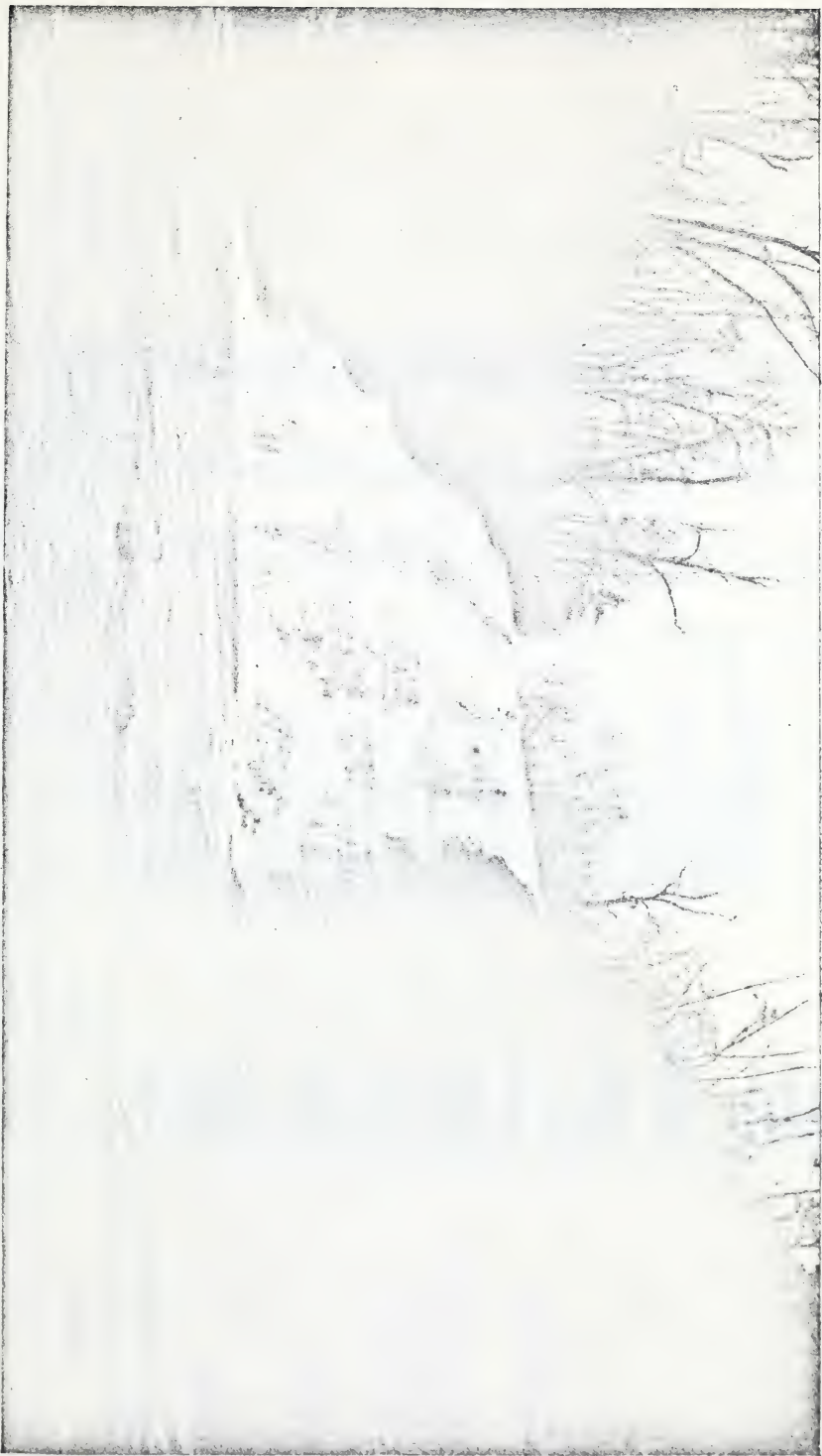
	ALCOVY RIVER.	White & Garner's Sh'sls.	Low Wat'r	55.0	85.0	3,800	531	U. S. C.	{ L. W. vol. = 55 cu. ft. per sec. (10th U. S. Census.)
30 H. P.	Newton County	White & Garner's Sh'sls.	{ Flush	416.6	85.0	3,800	4,024	Anderson.	{ Newton Factory. Burned during the war.
30 H. P.	Monroe County	High Falls.	Low Wt	138.1	96.8	1,200	1,520	Anderson.	{ Utilized; as grist mill.
	OCHULTEE RIVER.								
None	Newton County	Barnes' Shoals	"	1,015.0	14.0	1,300	1,614	"	{ At junction of South and Yellow Rivers.
20 H. P.	Bulls County	Key's Ferry	"	1,386.6	7.5	1,900	1,172	"	
None	"	Harper or Pitman Shoal	"	1,476.6	28.0	5,500	4,698	"	
"	"	Pitman Ferry	"	1,476.6	6.0	1,650	1,006	"	Below ferry.
20 H. P.	"	Roache's or Cargie's Sil	"	2,116.6	6.4	3,350	1,539	"	At Smith's ferry.
Small Mill	"	Lamar's Shoals	"	2,116.6	18.0	1,000	4,328	"	
50 H. P.	Monroe County	Glover's	"	2,116.6	16.0	4,000	3,848	"	
None	"	Dames	"	2,116.6	6.0	1,500	1,413	"	
"	"	Long or Carden's Shoals	"	2,116.6	9.0	4,500	2,164	"	
"	Bibb County	Holton	"	2,125.0	6.0	3,900	1,449	"	
"	"	Macon	"	2,156.0					
"	"	Proposed Macon Canal	"	2,116.6	40.0	10 m.	9,621	"	{ Fall and dist. taken from 10th U. S. Cen.
	NORTH OCONEE RIVER.								
32 H. P.	Jackson County	Hurricane Shoal	"	73.1	30.0	600	237	"	
"	"	Tumbling Shoal	"	126.0	8.0	600	113	"	
200 H. P.	Clarke County	Athens Factory	"	331.9	12.0				At Athens.
200 "	"	Georgia Factory	"		21.0	2,100	704	Anderson.	Near junction of rivers.
	Hall County	Carnesville and Gainesville Road		31.5	10.0		34	Barrow.	
	MIDDLE OCONEE RIVER.								
None	Jackson County	Tallasee Bridge	Low Wt	241.3	32.0	3,600	999	Anderson.	{ Total fall said to be 58 ft. in less than a mile.
"	Clarke County	McElroy's Mill	"	241.3	23.0	2,600	718	"	
60 H. P.	"	Princeton Factory	"	290.6	15.0	Dam	495	"	
	APALACHEE RIVER.								
	Oconee County	Just above High Shoals			20.0			U. S. Cen.	
150 H. P.	"	High Shoals	Normal.	131.6	50.0	600	792	Anderson.	
30 H. P.	"	Price's Mill	"	159.6	19.0	900	301	"	

ALTAMAHA BASIN—WATER-POWERS—Continued

Utilized Power.	LOCATION OF POWER.	POINT OF SECTION.	Stage of Water.	Cubic Feet per Second.	Fall in Feet.	Length of Shoal in Feet.	Gross H. P.	Source of Information.	REMARKS.
	Morgan County	Furlow's Shoals	Low W	47.0	26.0	4,200	139	U. S. Cen.	8' at mill, and 18' above.
	"	Read's Mill	"	76.0	8.0		69	"	
150 H. P.	Oconee River.								
	Oconee County	Barnett's Shoal	"	624.1	54.0	4,000	3,830	Anderson.	{ 5 miles below junction of Middle and North Oconee rivers.
	Morgan County	Seull's Shoal			10.0	Dam		{ 10th U.	{ Powell Mfg. Co.'s dam
	"	Park's Mill			8.0	"		{ S. Cen.	{ backs water 2 miles.
	Intervening two shoals				7.0			"	Grist mill.
	Putnam County	Long Shoal		533.3	12.0	1,300	726	"	{ Old factory site, not in use. Head can be made 15 or 20 feet by dam.
	Intervening six shoals.				33.0				
	Baldwin County	Milledgeville		740.0	34.0	5 or 6 m.	2,859	{ 10th U.	Canal proposed.
	Hall County	6 miles from Gainesville		30.	39.0		133	{ S. Cen.	Head waters.
	LITTLE RIVER.								
	Putnam County	Site of old Eatonton Fy	Low W	45.0	25.0	900	127	{ 10th U.	{ Volume estimated. No utilized power.
	"	Grist mill	"		8.0			"	
	"	"	"		13.5			"	
	"	Pierson's Mill	"		7.0			"	
	"	Humber's Mill	"	108.0	9.0		110	"	Volume estimated.

Net H. P. = 80 per cent. of gross H. P.

NOTE.—The foregoing is a very imperfect statement concerning the water-powers of the Altamaha Basin; but it is the best that can be done with the data at hand.



CANE CREEK FALLS, NEAR DAHLONEGA, GA.

ALTAMAHA BASIN — UTILIZED POWER

STREAM	COUNTY	KIND OF MILL	No. of Mills	Total Fall Used, in feet	Total Net H.P. Used	REMARKS.
Tributaries to Altamaha River.	Tattnall	Flour and Grist	3	.....	62	
"	"	Sawmill.	2	21	55	
"	Johnson	Flour and Grist	2	15	24	
Oconee River	Baldwin	"	2	12	70	
"	Putnam	"	2	15	70	
"	Greene	Cotton Factory	1	10	.....
"	"	Flour and Grist	3	26	104	
"	Clarke	"	1	8	6	
Little River	Putnam	"	4	32	165	
"	"	Sawmill.	1	7	20	
"	Morgan	Flour and Grist	2	22	25	
"	Newton	"	2	47	30	
"	"	Cotton Gin	1	25	15	
"	Walton	Flour and Grist	1	40	45	
Morgan	"	"	1	20	20	
Apalachee River	Walton	Cotton Factory	1	20	100	
"	"	Flour and Grist	5	42	124	
"	Gwinnett	"	1	22	10	
Other Tributaries of Oconee River.	Laurens	"	3	34	50	
"	"	Sawmill	2	22	50	
"	Johnson	Flour and Grist	2	16	23	
"	Twiggs	"	3	.....	63	
"	"	Sawmill	1	6	20	
"	Washington	Flour and Grist	3	.....	38	
"	Wilkinson	"	12	69	140	
"	"	Sawmill	8	4	102	
"	"	Agricultural Implem'ts.	1	3	4	
"	Hancock	Flour and Grist	6	94	95	
"	Jones	"	4	60	98	
"	Baldwin	"	3	37	60	
"	Jasper	"	2	30	32	
"	Putnam	"	6	73	178	

ALTAMAHA BASIN — UTILIZED POWER — Continued.

STREAM	COUNTY	KIND OF MILL	No. of Mills	Total Fall Used, in Feet	Total Net H. P. Used	REMARKS
Other Tributaries of						
Oconee River	Putnam	Sawmill	1	8	25	
"	Morgan	Flour and Grist	7		90	
"	Walton	"	6	91	122	
"	Greene	"	1	16	50	
"	"	Sawmill	1	23	32	
"	"	Cotton Gin	2	41	11	
"	Oconee	Flour and Grist	1	22	30	
"	Oglethorpe	"	2	56	30	
"	"	Sawmill	4	128	100	
"	Gwinnett	Woolen-mill	1	16	12	
"	Clarke	Cotton Factory	2	32	330	
North Oconee River	"	"	1	20	100	
Middle Oconee River	"	"				
North and Middle Oconee and Tributaries	"	Sawmill	1	12	10	
"	"	Paper-mill	1	16	75	
"	"	Flour and Grist	4	52	82	
"	Gwinnett	"	1	32	26	
"	"	Sawmill	1	12	12	
"	Madison	Flour and Grist	2	29	13	
"	Hall	"	11	170	130	
"	"	Sawmill	1	16	15	
"	Jackson	"	8	146	141	
"	"	Flour and Grist	13	201	187	
"	"	Cotton Gin	5	82	70	
"	"	Leather	1	30	10	
"	"	Woolen-mill	1	8	6	
"	"	Flour and Grist	1	12		
Ocmulgee River	Monroe	"	1	12		
"	Jones	"	1	48	103	
"	Butts	"	4	12	40	
"	"	Sawmill	1	12	6	
"	Jasper	Woolen-mill	1	12		
"	Henry	Flour and Grist	2	34	14	

[illegible]

Rockdale Paper-mill.

ALTAHAMA BASIN—UTILIZED POWER—Continued

STREAM	COUNTY	KIND OF MILL	No. of Mills	Total Fall Used, In Feet	Total Net H.P. Used	REMARKS
South River	DeKalb	Cotton Factory	1	25		
"	Henry	Flour and Grist	1	8	20	
"	"	Agricultural Implem'ts	1	9	3	
"	"	Furniture	1	9	3	
"	"	Sawmill	1	9	20	
"	Newton	"	1	30	10	
"	"	Flour and Grist	1	30	25	
"	Rockdale	"	2	24	39	
"	"	"	1	16	4	
"	"	Cotton Gin	1	9	6	
"	"	Furniture	2	35	65	
"	DeKalb	Flour and Grist	1	10	15	
"	"	Sawmill	1	10	12	
"	"	Cotton Gin	1	10	5	
"	"	Furniture	1	10	5	
"	Fulton	Sawmill	2	22	9	
"	"	Flour and Grist	2	84	24	
"	Pike	"	2	74	55	
Other Tributaries of Ocmulgee R.	Monroe	"	11	157	148	
"	"	Sawmill	1	11	9	
"	"	"	1	11	5	
"	Henry	Cotton Gin	3	78	38	
"	"	Flour and Grist	2	33	23	
"	"	Sawmill	4	52	45	
"	Butts	Flour and Grist	3	119	26	
"	Henry	"	1	10	10	
"	"	Sawmill	1		5	
Tributaries of South River	"	Woolen-mill	2	36	33	
"	Clayton	Flour and Grist	3	62	48	
"	Rockdale	"	1	18	6	
"	"	Sawmill	2	31	22	
"	"	Cotton Gin	1	8	4	
"	"	Leather	1	30	12	
"	Newton	Flour and Grist	1	180	30	
"	DeKalb	"	10		128	



TOCCOA FALLS.

OGEECHEE BASIN—UTILIZED POWER.

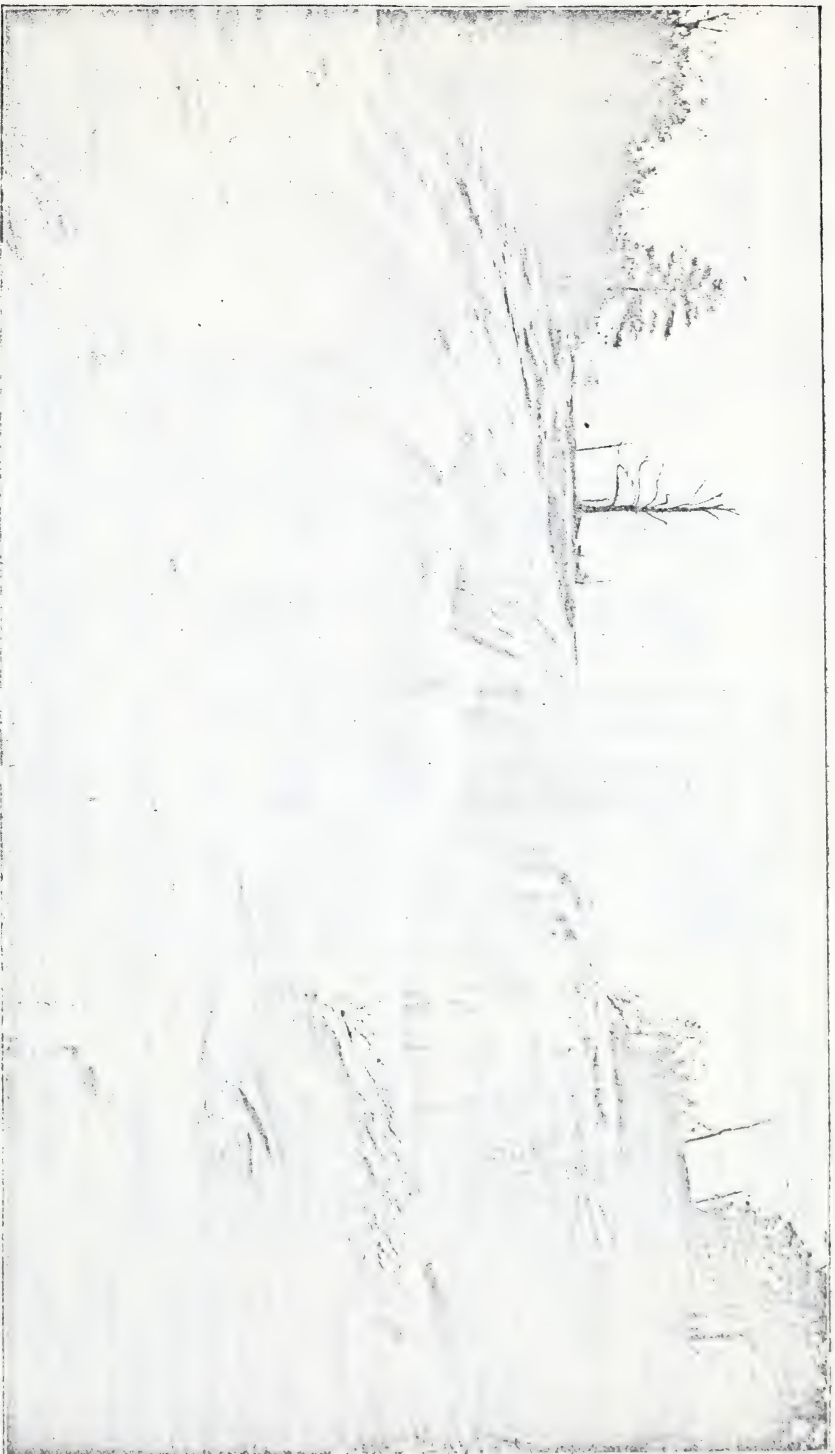
STREAM	COUNTY	KIND OF MILL	No. of Mills	Fall Used, in Feet	Total Net H. P. Used	REMARKS
Ogeechee River	Warren	Flour and Grist-mill	2	20.0	30	
"	Hancock	"	2	13.0	40	
"	"	Woolen Mill (Carder)	1	8	8	
"	Warren	Cotton Factory	1	16.0	150	
"	Fallafarro	Flour and Grist-mill	1	22.0	15	
Tributaries to Ogeechee River	Liberty	"	1	9.0	20	
"	"	Sawmill	2	27	27	
"	Bulloch	Flour and Grist-mill	5	36.0	20	
"	"	Sawmills	2	17.5	24	
"	Screven	Flour and Grist-mill	1	10.0	8	
"	"	Sawmill	1	10.0	12	
"	Burke	Flour and Grist-mill	9	75.0	117	
"	Jefferson	"	9	82.0	189	
"	Washington	"	1	21.0	83	
"	Glascok	"	4	60.0	54	
"	"	Sawmill	2	23.0	27	
"	Hancock	Flour and Grist-mill	2	42.0	30	
"	Warren	"	1	9.0	12	

SAVANNAH BASIN--IMPORTANT STREAMS.

STREAMS	TRIBUTARY TO	COUNTY	REMARKS
Savannah River.....	Atlantic Ocean.....	.....	.....
Beaverdam Creek.....	Savannah River.....	Screven.....	{ Jacksonboro, 87.3 cu. ft. per sec.; 7 ft. fall. (Barrow.)
Briar Creek.....	".....	".....	{ Mill Haven, 565.5 cu. ft. per sec.; 10 ft. fall. (Barrow.)
Rocky Creek.....	".....	".....	{ Wade's Mill, 12 cu. ft. per sec.; 5 ft. fall. (Barrow.)
Spirit Creek.....	".....	Richmond.....	{ 12 cu. ft. per sec.; 8 ft. fall. (Barrow.) Little
Butler's Creek.....	".....	".....	{ Spring Cr. at mouth.
Rock Creek.....	".....	".....	.....
Bottie's Creek.....	".....	Columbia.....	.....
Kiokee Creek.....	".....	".....	.....
Keg Creek.....	".....	".....	{ Near Appling, 20 cu. ft. per. sec.; 10 ft. fall, low
Little River.....	".....	McDuffie.....	{ water. (Barrow).
Sweetwater Creek.....	".....	".....	.....
Soap Creek.....	".....	Lincoln.....	{ Power at Mrs. J. Belknap Smiths, 47 cu. ft. per
Fishing Creek.....	".....	".....	{ sec.; 8 ft. fall; 218 H. P. utilized by six mills on
Pistol Creek.....	".....	".....	{ river.
Broad River.....	".....	".....	{ Cotton card factory; 21 feet head; 36 gross H. P.
Long Creek.....	Broad River.....	Oglethorpe.....	{ (Barrow.)
S. Fork, Broad River.....	".....	".....	.....
Groves Creek.....	S. Fork, Broad River.....	".....	{ Franklin Co., Toceca and Carnesville Road, 50 cu.
Cloud's Creek.....	".....	".....	{ ft. per sec.; low spring. (Barrow.)
Beaverdam Creek.....	".....	".....	{ 4 m. from Lexington, 7.2 cu. ft. per sec.; 10 ft. fall.
Millshead Creek.....	".....	Madison.....	{ (Barrow.)
Bushy Creek.....	".....	".....	{ At Eberhart's Mill, 80 ft. fall in 1 m. (U. S. Cens.)
N. Fork, Broad River.....	Broad River.....	Franklin and Madison.....	{ At Watson's Mill, 30 ft. fall in 1 m. (U. S. Cens.)

SAVANNAH BASIN—IMPORTANT STREAMS—Continued.

STREAM.	TRIBUTARY TO	COUNTY.	REMARKS.
Hudson's Fork	N. Fork, Broad River	Banks and Franklin	{ Homer and Mt. Airy Road, 77.3 cu. ft. per sec., nor- mal. (Locke.)
Unawattee Creek	" " "	Franklin.....	{ 4 miles from Carnesville, 50 cu. ft. per second, nor- mal. (Barrow.)
Webb's Creek.....	Hudson Fork, Br'd River.....	Banks.....	
Clear Creek.....	N. Fork, Broad River.....	Franklin.....	
Beaverdam Creek	Savannah River.....	Ellert	{ Point east of Southern R'y, 30 cu. ft. per sec. (Barrow.) Stream has 9 mills and several good undeveloped shoals. (U. S. C.)
Cold Water Creek.....	" " "	Ellert.....	
Lightwood Log Creek	" " "	Hart.....	
Tugalo River	" " "	Hart.....	
Panther Creek.....	Tugalo River	Habersham	Walker's mill, 4.5 cu. ft. per sec.; 20 ft. fall. (Barrow.)
Tallulah River	" " "	Rabun	Tallulah Falls. (See Power Table.)
Toccoa Creek.....	" " "	"	{ Toccoa Falls, 5.2 cu. ft. per sec.; 190 ft. fall. (Barrow & Locke.)
Parkman Creek	" " "	"	{ Parker's mill, 333.7 cu. ft. per sec., normal. (C. G. Anderson.)
Chattooga River.....	Tallulah River	Rabun	
Chattooga River.....	Tugalo River	Rabun	{ Near Clayton, 3.7 cu. ft. per sec. At mouth, 30 cu. ft. per sec. (Barrow.)
Steele Creek.....	Chattooga River	Rabun	
War Woman Creek	" " "	Rabun	At mouth, 50 cu. ft. per sec., low water. (Barrow.)
Wildcat Creek	" " "	Rabun	At mouth, 40.6 cu. ft. per sec., low water. (Barrow.)
Tiger Creek	" " "	Rabun	



HIGH FALLS OF THE TOWALIGA, MONROE COUNTY.

SAVANNAH BASIN—WATER-POWERS

LOCATION OF WATER-POWER	POINT OF SECTION	Stage of Water	Cubic Feet per Second	Fall in Feet	Length of Shoal, in Feet	Gross H. P. ¹	Source of Information	REMARKS
TALLULAH RIVER								
Rabun County	Tallulah Falls	Normal	723.3	335.0	4,000	27,470	Anderson	
TUGALO RIVER								
Habersham County	Mouth of Tallulah River	Low Water	654.0	75.0	2½ m.	5,573	{ J. P. Carson, 1,725 cu. ft. per second " { U. S. Eng.	
Franklin County	Eastonally Shoals .....	"	.....	4.0	2,640	.....	"
"	Stribling Shoals .....	"	.....	2.0	2,640	.....	"
Hart County	Guest Shoal	"	290.0	17.0	5,280	560	10th U. S. Census	
"	Hatton Shoal	"	290.0	39.0	8,000	1,280	"	
BROAD RIVER								
Elbert County	Baker's Ferry	"	600.0	3.0	600	204	"	{ Fall said to be over 70 ft. in 1¼ miles, U. S. Census.)
"	Anthony's Shoals	"	600.0	70.0	6,000	4,772	"	
"	Smith Shoals	"	600.0	10.0	2,640	681	"	
SAVANNAH RIVER								
Hart County	McDaniel's Shoals .....	.....	766.6	30.0	5 m	2,600	"	{ Volume as given by U. S. Eng. J. P. Carson, 1,725 cu. ft. per second
Elbert County	Perrill's Ledge .....	.....	766.6	3.0	360	260	"	Vol. etc., 1,750 cu. ft. per sec.
"	Middleton's Shoals .....	.....	833.3	18.0	5,280	1,700	"	Vol. etc., 1,873.3 "
"	Gregg's Shoal .....	.....	833.3	14.0	5,280	1,325	"	Vol. etc., 2,000, "
"	Bowman's Ledge .....	.....	880.0	3.0	1-0	360	"	Vol. etc., 2,100, "
"	Cherokee Shoal .....	.....	880.0	9.0	2,640	900	"	Vol. etc., 2,150, "
"	Procter's Shoal .....	.....	107.5	75.0	7 m	9,165	"	Vol. etc., 2,400, "
Lincoln County	Long Shoal .....	.....	1,800.0	35.0	5 m	7,250	"	Vol. etc., 2,775 "
Columbia County	Blue Jacket Shoal .....	.....	2,166.6	10.0	600	2,350	"	
Richmond County	Augusta	I. Season Dry Yrs. Max. with Storage	2,400.0	50.0	Canal 7 miles	13,636	"	The city owns the water-power and factory sites. Mfg. Cos. buy sites and lease power.
"	{ Same with average head	L. Season	6,000.0	50.0	"	34,090	"	
"	{ attainable	Dry Yrs.	2,400.0	40.9	"	10,908	"	

¹ Net H. P. = 80 per cent. of gross H. P.

SAVANNAH BASIN—UTILIZED POWER.

STREAM	COUNTY	KIND OF MILL	No. of Mills.	Total Fall Used	Total Net H. P. Used	REMARKS
Savannah River.....	Richmond	Miscellaneous.....	15	....	3,050	
" ".....	Lincoln	Flour and Grist.....	3	14	32	
" ".....	Elbert	" ".....	2	19	115	
Tributaries of Savannah R.....	Effingham	Sawmill.....	1	6	20	
" ".....	Burke	Flour and Grist.....	8	72	96	
" ".....	Richmond	" ".....	11	125	190	
" ".....	"	Sawmill.....	8	100	209	
" ".....	"	Cotton Factory.....	1	9	50	
" ".....	"	Woolen-mill.....	1	9	45	
" ".....	"	Sawmill.....	3	24	45	
Little River.....	Lincoln	Flour and Grist.....	4	30	60	
" ".....	"	" ".....	1	9	60	
" ".....	McDuffie	Gold Stamp-mill.....	1	8	12	
" ".....	Wilkes	Flour and Grist.....	1	8	8	
" ".....	Warren	" ".....	1	8	30	
" ".....	Greene	" ".....	1	14	5	
Other Tributaries of Savannah River.....	Columbia	Saw and Grist.....	5	69	91	
" ".....	"	Flour and Grist.....	1	10	25	
" ".....	McDuffie	Sawmill.....	1	127	152	
" ".....	Warren	Flour and Grist.....	7	20	15	
" ".....	"	" ".....	1	1	1	
Broad River & Tributaries.....	Oglethorpe	Sawmill.....	10	195	175	
" ".....	Valdison	Flour and Grist.....	10	145	281	
" ".....	"	" ".....	5	61	64	
" ".....	Elbert	Sawmill.....	3	44	39	
" ".....	Franklin	Flour and Grist.....	9	....	163	
" ".....	"	" ".....	4	56	54	
" ".....	"	Cotton Gin.....	6	83	53	
" ".....	Banks	Sawmill.....	1	18	20	
" ".....	"	Sawmill.....	12	169	279	
Other Tributaries of Savannah River.....	Wilkes	Flour and Grist.....	7	85	75	
" ".....	Elbert	" ".....	6	73	134	
" ".....	"	Sawmill.....	1	14	12	

SAVANNAH BASIN—UTILIZED POWER—Continued

STREAM	COUNTY	KIND OF MILL	No. of Mills	Total Fall Used	Total Net H. P. Used	REMARKS
Other Tributaries to Savannah River	Hart	Flour and Grist	11	194	156	
"	"	Sawmill	1	14	15	
"	"	Cotton Gin	8	99	50	
Tributaries of Tugalo River	"	Sawmill	1	30	10	
"	"	Flour and Grist	2	27	45	
"	"	Cotton Factory	1	26	20	
"	"	Wool Carder	1	20	44	
"	Habersham	Flour and Grist	4	47	46	
"	"	Leather	1	16	6	
"	"	Sawmill	3	46	58	
"	"	Woolen-mill	1	...	6	
"	Rabun	Sawmill	1	14	8	

OCKLOCKONEE AND SUWANNEE BASINS—UTILIZED POWER

Ocklocknee R. and Tributaries	Colquitt	Flour and Grist	3	16	30	
"	Decatur	"	4	64	50	
"	"	Sawmill	1	6	12	
"	Thomas	Flour and Grist	4	32	34	
Ocilla R. and Tributaries	"	"	4	60	50	
Tributaries of the Suwannee River	Berrien	Woolen-mill	1	12	12	
"	"	Flour and Grist	10	82	145	
"	"	Sawmill	1	9	10	
"	Brooks	Woolen-mill	1	...	12	
"	"	Sawmill	1	10	10	
"	"	Flour and Grist	7	43	54	
"	Clinch	"	1	7	15	
"	Echols	"	1	6	6	
"	"	Cotton Gin	1	12	6	
"	Lowndes	Sawmill	1	10	10	
"	"	Flour and Grist	8	80	77	
"	Wilcox	"	1	6	4	

SOILS.

The soils of Georgia vary greatly in different regions and present diversities of character corresponding to the differences in composition of the underlying rocks from which they have been derived. With the exception of the alluvial deposits of streams, they are everywhere the result of the weathering of the country rock; and in almost any railroad cut in the hilly upland part of the State, the different stages of weathering and decay can be observed, from the perfectly formed soil at the top, through coarse-grained gravelly soil and partially decayed rock to the firm underlying material below. Such being the case, the classification of the soils will necessarily correspond with that of the different geological formations.

In the Paleozoic area the soils derived from those of the limestone beds, which do not carry a large amount of silicious matter, and from the calcareous shales, are reddish loamy soils, and are among the most fertile of any in the State.

Where a large amount of chert is present in the limestone, gray soils result, varying with locality in their fitness for agricultural purposes. The sandstones of the Paleozoic region form sandy soils, and the different shale formations give rise to a variety of soils, some, as mentioned above, that are quite fertile, and others that are sterile.

In the Crystalline area two varieties of soils are distinguishable. The first gives rise to the red clay lands and the other to the gray, gravelly, or sandy lands.

The red clay soils are derived from schists, gneisses and granitoid rocks containing ferro-magnesian minerals, yielding on decomposition hydrated ferric oxide of iron, which gives to the soil its deep-red or brownish-red stain.

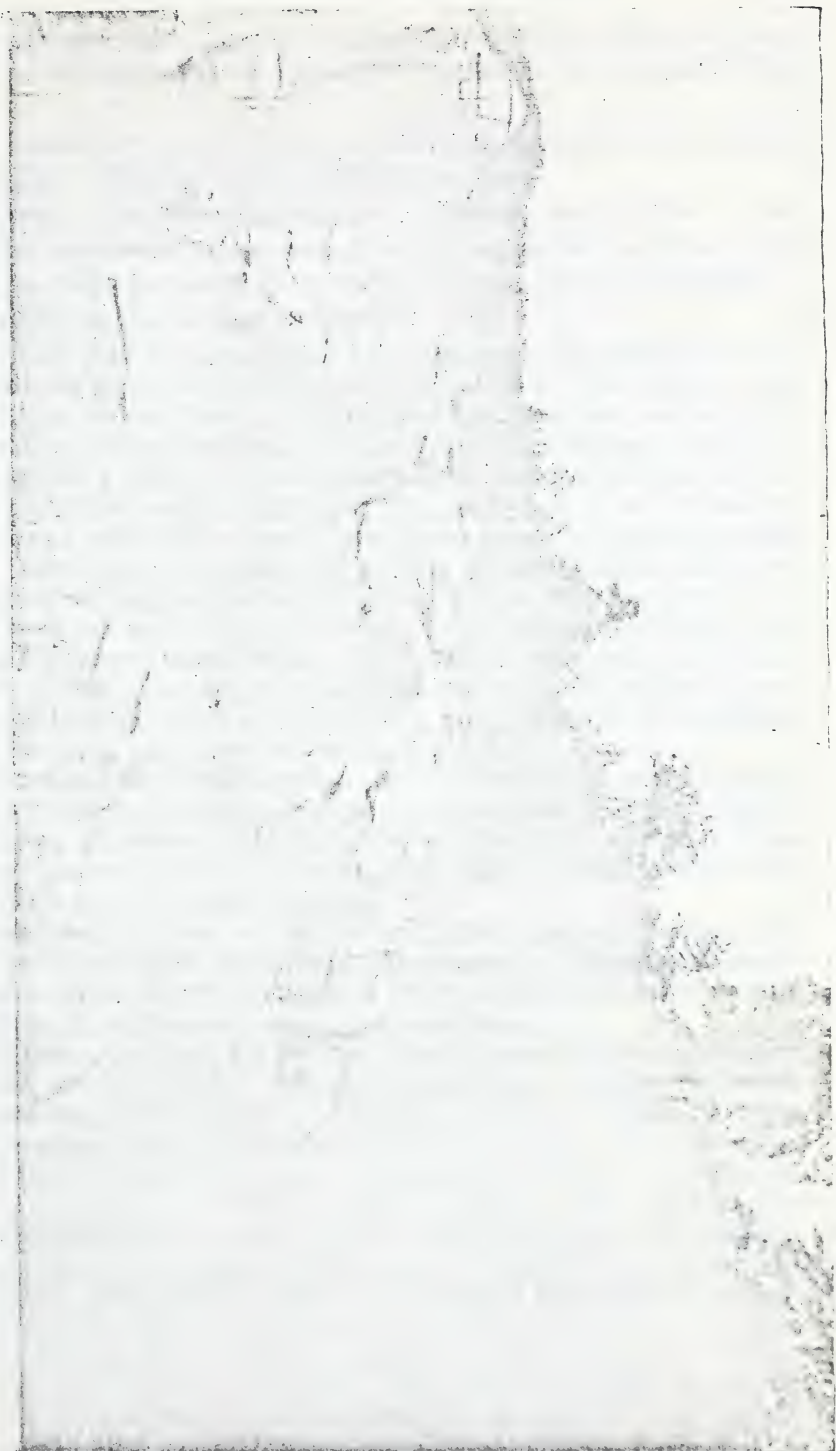
The gray soils are coarser grained than the preceding and are derived from the disintegration of granites, and in some localities from gneisses, and grade into the finer grained red soils wherever complete chemical decomposition has succeeded mechanical disintegration.

Most of the soils of the Crystalline area where not naturally fertile respond well to fertilization, the clay subsoil that underlies the most of them preventing the leaching out of plant-food.

The soils of the coastal plain region have been derived principally from the Columbia and Lafayette formations, and are prevailing sandy or clayey sands or loams.

Their constitution varies according to locality from almost pure sand to the darkest brick-red loams of the Lafayette. At some places calca-

IRON ORE MINE, NEAR TAYLORSVILLE, POLK COUNTY, GA.



reous rocks underlying these formations outcrop, and at different points limestones and marls have an important influence on the character of the soil.

No detailed investigation from a geological standpoint has yet been made on the soils of the southern part of the State.

A paper on the Mineral Resources of Georgia read by Prof. S. W. McCallie before the International Mining Congress held at Boise City, Idaho, in the latter part of July, 1901, will form a fitting conclusion to this chapter on the Geology of Georgia.

All of the great divisions of geological history are represented in Georgia with the exception probably of the Jura-trias. The northern and central parts of the State known as the Crystalline area are made up largely of gneisses and schists, which are supposed to represent the southern extension of the old Archean continent. To the northeast of this ancient land surface and comprising the greater part of ten counties in the extreme northwestern part of the State, occur the Paleozoic rocks; while to the south, extending over an area of 30,000 square miles, are the wide-spread deposits of the Cretaceous and the Tertiary periods. A State thus endowed with such diversity of geological formations must necessarily possess extensive and varied mineral resources. In the discussion of these resources, many of which are in a large measure at present in an incipient stage of development, only those will be considered whose economic importance can not be questioned.

The red and the brown iron ores constitute one of the most important mineral resources here to be considered, and one that has been a continuous source of revenue to the State for more than half a century. These ores are confined mainly to the Paleozoic area of Northwest Georgia, where they occur in large quantities.

The brown iron ores, or more properly speaking, the limonites, are most abundant in Polk, Bartow and Floyd counties. Nevertheless, workable deposits are also to be found in every county in the northwestern part of the State with only one or two exceptions.

The brown iron ores are confined chiefly to two different geological horizons, viz., the Weisner quartzite, and the Knox dolomite, the former of Cambrian, and the latter of Silurian age. The Weisner quartzite, which corresponds to the Potsdam sandstone of New York, is an extensive deposit of mountain-making metamorphic sandstone, forming the eastern boundary of the Paleozoic rocks. At many points the formation has been subjected to intense pressure during the process of mountain-making, and as a result, its strata are frequently much folded and brecciated. Along the line where the dynamical forces have acted most energetically is a great displacement in the strata known as the Cartersville fault near which all of the main iron ore deposits of the Weisner quartzite are located. These ores, which always run high in metallic iron and low in sulphur and other impurities, often occur in well-defined fissure-veins, but generally they are found in the form of irregular de-

posits in the residual clays, or as thick sheets, or blankets, overlying the metamorphic sandstone. The fissure-veins vary from a few feet to several yards in width and frequently continue for a quarter of a mile or more in length. They always dip at a high angle and apparently extend to a great depth. The ore of these veins is generally more or less porous and is usually of an excellent quality.

The blanket deposits are not so plentiful as the residual or the fissure deposits; nevertheless they are of special economic interest on account of the large quantities of ore which they contain. These deposits in the extreme northeastern part of Bartow county, in what is known as the Sugar Hill district, often mantle the mountain side to the depth of many feet. One of the deposits of this district has been producing daily for the last few years from twenty to thirty cars of high grade ore, and yet there still remain large quantities of the ore in sight. It is questionable whether there are to be found anywhere in the south brown iron ore deposits which will surpass, or even equal in extent, the blanket deposits of the Weisner quartzite of Bartow county.

The brown iron ores of the Knox dolomite formation occur chiefly in the form of pockets or irregular deposits in the residual clays. These deposits are quite variable in size. Sometimes they produce only a few carloads of ore but generally they are far more extensive and cover a considerable area. Some of the individual deposits in the vicinity of Cedartown have been worked on an extensive scale for more than twenty years without exhausting the supply of ore. It is not an uncommon thing to find the deposits extending over six or eight acres, but in such cases the deposit is not equally rich in all parts. The depth to which the ores of the Knox dolomite formation extend, as well as its surface dimensions, is variable. In some instances the deposits are very superficial, extending only a few feet below the surface, while in other cases they have been worked to the depth of eighty feet or more without reaching their limit.

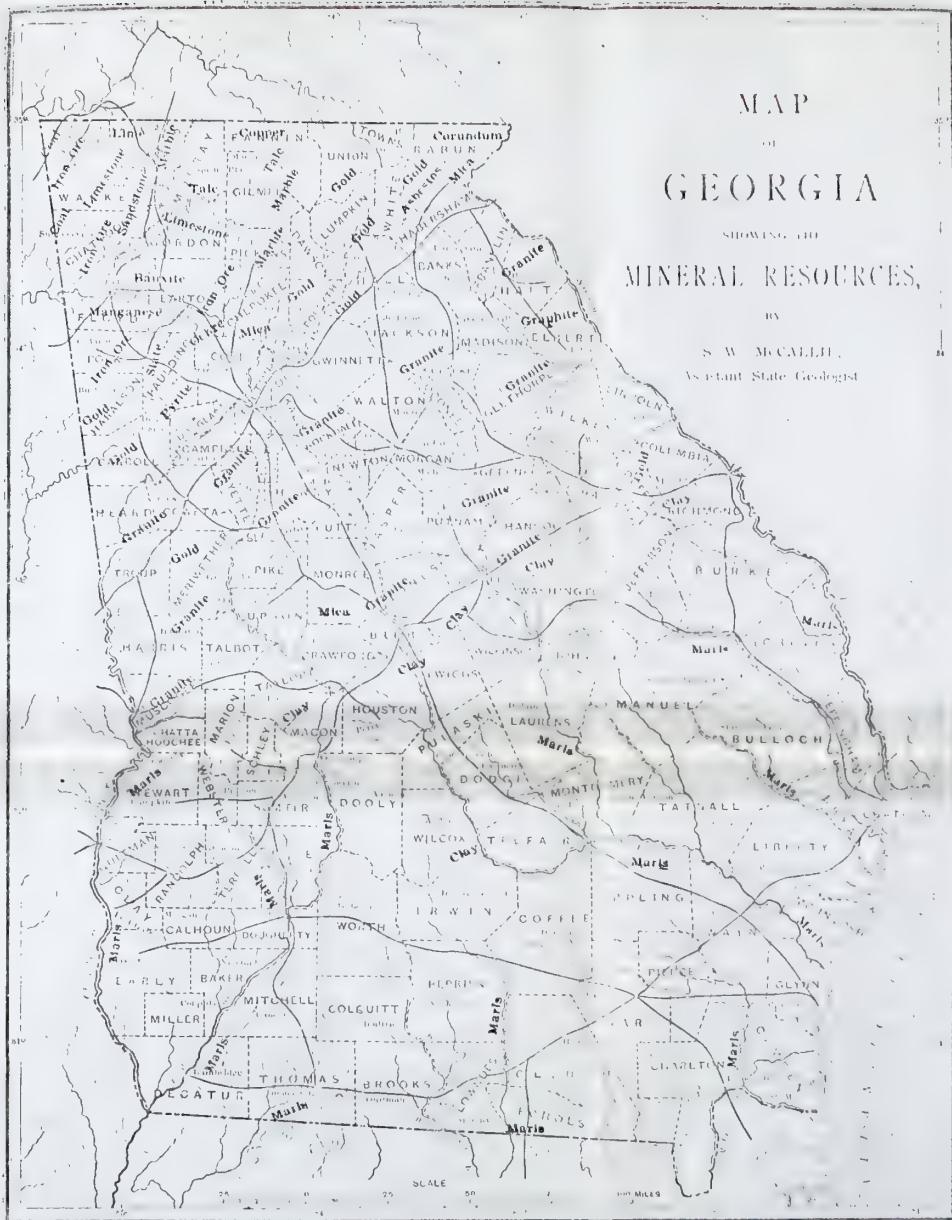
In addition to the above brown iron ore bearing formations there are two others, viz.: the Deaton limestone and the Fort Payne chert, which have also produced considerable ore. The ore from these formations is similar to the ore occurring in the Knox dolomite series though, as a general rule, it does not run as high in metallic iron.

The total amount of brown iron ore produced from these several deposits last year aggregated more than 400,000 tons, thus making Georgia the third in the list of brown iron ore producing States in the south.

The Red Iron Ores.—The red, or fossil, iron ores of Georgia are confined chiefly to three counties in the extreme northwestern part of the State. These ores occur in what is known as the Rockwood formation, which is the northern extension of the Red Mountain, or the Clinton iron ore bearing series of Alabama. Stratigraphically, the Rockwood formation occupies the same position in the geological scale as the fossil iron ore bearing rocks of New York and Pennsylvania.

The Rockwood formation in Georgia is made up of shales, sandstones, and thin-bedded limestones with from one to three beds of fossil iron ore. The formation, though not necessarily ridge forming itself, always out-

GEORGIA

S. W. McCALL, Jr.
Kent State Geologist

crops along the side or at the base of the mountains and ridges. It is exposed at the base of Sand, Lookout, Pigeon and Dirt Seller's mountains, and also along the slopes of Taylor's Ridge, where it attains a total thickness of several hundred feet.

The workable iron ore is found usually near the center of the Rockwood formation, where it occurs in continuous beds varying from a few inches to several feet in thickness. Each of the beds, which usually dip at a low angle, generally carries two varieties of ore, viz.: the soft ore and the hard ore. The soft ore, which forms the weathered part of the bed, rarely ever extends to a depth of more than ten or fifteen feet below the surface. It differs from the hard ore mainly in having little or no lime present, and as a consequence, always runs higher in metallic iron than the hard ore. The relative chemical composition of the soft and the hard ore is shown by the following analyses:

Hard Ore.—Metallic iron, 32.19; lime, 23.19; phos., 0.804.

Soft Ore.—Metallic iron, 59.00; silica, 9.11; phos., .092.

Some idea may be had as to the abundance of the red fossil iron ores of Georgia, when it is stated that the aggregate length of the outcroppings of the beds, which average more than two feet in thickness, is about 150 miles, and that in places the ore can be economically mined to the depth of more than 200 feet.

The output of the red iron ores of Georgia last year was not so great as that of the brown iron ores. Nevertheless, should the price warrant it, the output of these ores could be increased to meet almost any demand.

Coal.—The coal measures of Georgia which occur in the northwestern part of the State, form the northern extension of the Warrior Coal Field of Alabama. They are confined chiefly to Sand and Lookout mountains in Dade, Walker, and Chattooga counties, where they cover a total area of about 200 square miles. The coal formation of Georgia, as elsewhere in the great Appalachian coal fields, is divided into upper and lower measures. The upper measures are best developed on Lookout mountain, in the vicinity of Durham coal mine, where they attain a maximum thickness of about 900 feet. This division of the coal formation carries seven different coal seams, but only one is worked at present.

The lower coal measures are not so thick by many feet as the upper. However, they carry a greater number of workable coal seams. In the vicinity of Cole City, on Sand mountain, as many as three different seams have been worked in the lower measures more or less extensively. In addition to the three workable coal seams here mentioned, the lower measures contain two other seams which are probably also workable in places.

The coal obtained from both coal measures is an excellent quality of bituminous coal, well suited for coking and steam purposes. At present, there are three coal mines being operated in the State, two on Lookout, and one on Sand mountain, with a total output of about 14,000 tons per day, the greater part of which is used for coking purposes. Two of the mines, here referred to, are in the upper coal measures of Lookout, and the other is in the lower measures of Sand mountain. The mines on the

latter mountain have been worked almost continuously for more than half a century, and were among the first coal mines opened south of the Ohio river.

Manganese.—The manganese ores, like the brown iron ores, are confined chiefly to Bartow, Floyd and Polk counties. The largest and most productive deposits are found in Bartow county, in the vicinity of Cartersville, where the ores occur as irregular deposits in the residual clays derived from the Knox dolomite and the Weisner quartzite. The ores are usually in the form of nodular concretions, varying from a fraction of an inch to a foot or more in diameter. In places these concretions become so abundant that they form beds of considerable thickness. Deposits of this character which have been extensively worked, occur in the vicinity of Cave Spring, Polk county.

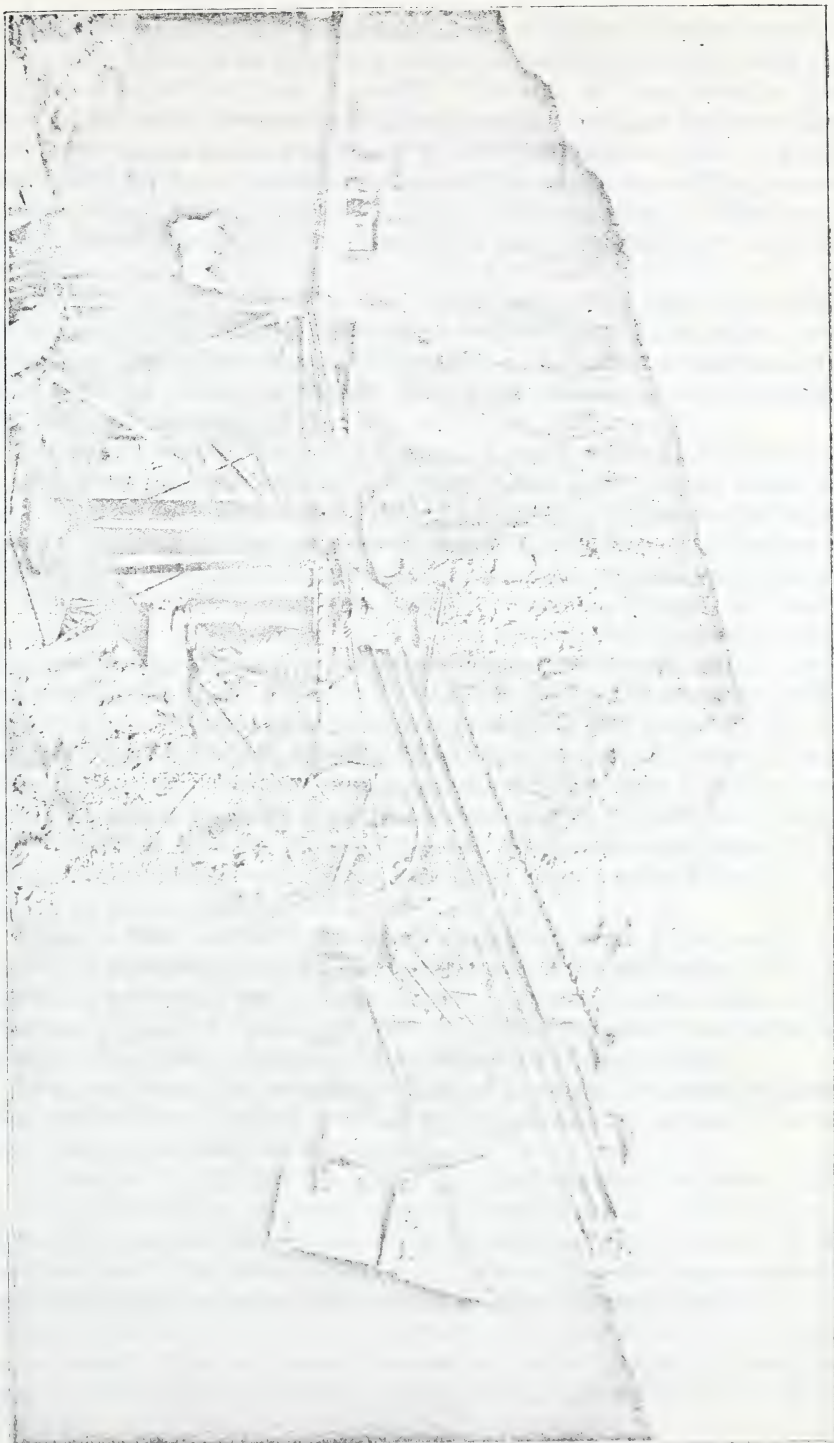
The manganese deposits of Georgia have been worked continuously for many years. During their early workings the ores were shipped to England, but at present, they find a ready market at home, where they are used in the manufacture of steel and for bleaching purposes. In 1898, Georgia produced nearly 7,000 tons of manganese ore, which was approximately one half of the manganese produced in the United States. With the exception, probably, of Virginia, Georgia easily stands first in the list of manganese producing States in the Union.

Ochre.—Ochre deposits of commercial value are found at a number of points throughout northwest Georgia, where they are always more or less intimately associated with the brown iron ores. The most extensive deposits are confined to the Weisner quartzite in Bartow county, near Cartersville. These deposits occur mostly along the western margin of the quartzite, where it has been much crushed and broken. According to Dr. C. W. Hayes, of the United States Geological Survey, the ochre forms a series of irregular branching veins, which intersect the fractured quartzite in all conceivable directions. At some points the veins become greatly enlarged and contain large quantities of excellent ore. Deposits of this character, which have been worked for some years, are to be seen at the eastern end of the county bridge across the Etowah river, near Emerson; and also at a number of points along the western margin of the Weisner quartzite north of that point. The ochre of these deposits, which is really only a pulverulent form of brown iron ore, is quite free from impurities, and well suited for making linoleum and paint.

The output from the ochre mines in the Cartersville district last year was nearly 4,000 tons, about one-fourth of the ochre output of the United States. The greater part of the ochre now being mined in Bartow county is said to be shipped to England, where it is used in the manufacture of linoleum. In addition to the above named ochre, which is known as yellow ochre, Georgia also produces a considerable amount of red ochre, which is the pulverized, or ground red fossil iron ore, obtained chiefly from Walker county.

Bauxite.—Bauxite, a hydrate of alumina, first discovered in America near Rome Ga., in 1887, is a clay-like mineral used principally in the manufacture of alum and the metal aluminium. The Georgia deposits

MINING ORE BY USE OF THE STEAM-SHOVEL, NEAR CEDARTOWN, POLK COUNTY, GA.



of this mineral are found mainly in Floyd, Polk, and Bartow counties, where they occur in more or less extensive pockets associated with the residual clays of the Knox dolomite. The size of these deposits, like those of the brown iron ores, is quite variable. In some instances they have been known to have produced several thousand tons, but as a rule the deposits are not so extensive. The physical appearance of the mineral bauxite, which varies from 30 to 70 per cent. alumina, is often amorphous, resembling kaolin, but generally it has a concretionary or oolitic structure.

The first bauxite mined in the United States was from Hermitage, Floyd county, in 1889. Subsequent to this date, other mines were opened in Floyd, Bartow and Polk counties, so that in a comparatively short time the mining of bauxite in Georgia became a very important and lucrative industry.

The annual output from the Georgia bauxite mines in the last few years has varied from 1,000 to 7,000 tons, the greater part of which has been shipped to Philadelphia, where it is used in the manufacture of alum. Previous to the opening of the bauxite mines of Arkansas in 1899, Georgia and Alabama produced all the bauxite mined in America.

Corundum.—Corundum was first discovered in Georgia on Laurel Creek, Rabun county, about 1871. This mineral has since been found in greater or less deposits in a number of counties throughout the northern part of the State. It occurs associated with peridotites, and other basic igneous rocks in the form of irregular veins and pockets. The corundum found in Georgia is usually pink, gray or blue. It is rarely transparent and as a consequence the gem sapphire or ruby is seldom met with. In a few instances these gems are reported to have been found, but they are probably of rare occurrence. The commercial value of the Georgia corundum may therefore be said to depend upon its use in the arts as an abrasive material.

Between 1880 and 1893, the corundum mines of the Laurel creek district were extensively worked and became one of the main sources of supply to the corundum trade of the country. About the same time, corundum was successfully mined at Track Rock, Union county, and favorable prospects were later exposed in Habersham and other counties.

In recent years the corundum mines of Georgia have remained inactive, due chiefly to the low price of corundum, and not as might be supposed to the exhaustion of the deposits.

Asbestos.—For the last few years the chief supply of asbestos mined in the United States has been obtained from Georgia. The mine supplying this material is located on Sal mountain, White county, in the northern part of the State. Asbestos, like corundum, is always associated with peridotites and other basic rocks. It exists in many localities in the northern part of the State but at present it is worked only at the above named mine. The asbestos of Georgia has never been investigated, and as a result but little is known of the extent and commercial value of the deposits.

Marbles.—Previous to 1884, the marbles of Georgia were practically

unknown as building and ornamental stones, but at present the output of the quarries exceeds that of any State in the Union, with the exception of Vermont.

The most valuable marbles of Georgia are those of the Crystalline area confined to Pickens, Cherokee, Gilmer and Fannin counties. These marbles occur in a narrow belt which runs parallel to the Atlanta, Knoxville and Northern R. R., from near Canton, Cherokee county, to the Georgia-North Carolina State line, a distance of more than sixty miles. The main marble industry of the State is located in the vicinity of Tate, Pickens county, just north of the southern terminus of the belt where the deposit attains a thickness of nearly 200 feet.

The Pickens county marble has a coarse texture but admits of a very fine polish and is admirably suited both for building and ornamental purposes. In color the stone varies from white to almost black. A flesh-colored variety is also found in considerable abundance. The physical and chemical properties, as shown by the numerous tests made by the State Geological Survey, demonstrate that its durability equals or exceeds that of any other marble now being put upon the market. The stone is remarkably free from fissures and seams, so that monoliths suitable for huge columns can be quarried with ease.

At present seven different marble quarries, having an aggregate annual output of several hundred thousand cubic feet of stone, are being operated in Pickens county. The product of these quarries is shipped to nearly every State in the Union, where it is used in the construction and decoration of some of the most costly buildings. The State capitols of Minnesota and Rhode Island; the United States Government Building, Boston; St. Luke's Hospital, New York; and the Coreoran Art Gallery, Washington, with numerous other handsome buildings throughout the United States are constructed wholly or in part of the Georgia marble.

In addition to the marbles here described there are also valuable deposits to be found in Whitfield county. These marbles belong to the same deposits that traverse East Tennessee and are extensively worked in the vicinity of Knoxville. The stone has a dark chocolate or light gray color and a rather fine texture. The light gray variety which is always quite compact and highly Crystalline, is traversed by dark zigzag lines that give to the polished surface a very pleasing effect. The Whitfield county marbles are well suited for building material, but they have not yet received the attention which their economic importance demands.

Granites.—The granites of Georgia, together with the gneisses, constitute the most extensive and important building and ornamental stones in the State. They occur in inexhaustible quantities and are profusely distributed throughout the Crystalline area. One of the most interesting and probably the largest granite mass in the world is that of Stone Mountain, located only a few miles northeast of Atlanta. This mountain whose barren summit attains an altitude of several hundred feet above the surrounding country, has long been the seat of a very important granite industry. The stone obtained from these quarries is a light-colored muscovite granite possessing remarkable strength and is quite free from all

chemical and physical defects. The stone has extensive use as a building material, and is also largely employed in street improvement. There is likely no granite in the south more widely known and more generally used than that furnished by the Stone Mountain quarries. It not only has an extensive local use, but much of it is shipped beyond the borders of the State.

Another granite, or rather a granitoid gneiss, of almost as much economic importance as the Stone Mountain granite itself, is the Lithonia gneiss. This stone, which differs chiefly from the Stone Mountain granite in being laminated, covers a considerable area in the eastern part of DeKalb and the contiguous parts of Rockdale and Gwinnett counties. The Lithonia quarries are very extensive and furnish large quantities of stone for street improvement as well as for general building purposes. Granites and granitoid gneisses similar to the above are found in many localities in North Georgia, but only at a few points have they been quarried to any extent.

In addition to the granites and granitoid gneisses here named there are other granites of superior quality used for monumental stone. Some of the granites of this character which in the last few years have become quite popular as decorative stone are those obtained from the Elberton, the Oglesby, the Lexington, and the Meriwether quarries. These monumental granites are fine-grained biotite granites unusually free from injurious minerals and admitting of a very brilliant polish. They have but few equals, if any superiors in the United States as a decorative stone, and it is only a question of time when the Georgia monumental granite industry will be of very great commercial value to the State.

Sandstone.—Sandstone has been quarried to a considerable extent in Catoosa county near Graysville. The stone, which is of Silurian age, has a dark-brown color and resembles very closely the brown sandstone of the Connecticut valley. It makes a beautiful building-stone and appears to be quite durable. This stone is found in great abundance in Taylor's Ridge, White Oak, Horn, and other mountains in the northeastern part of the State. Carboniferous sandstones of a light color and well adapted for building purposes occur in Lookout, Sand and Pigeon mountains.

Serpentine.—This is one of the most beautiful decorative stones found in the State. It occurs in workable quantities in Cherokee county, near Holly Springs, where it was quarried to a limited extent a few years ago. The stone, though difficult to work, admits of an excellent polish and is very desirable for ornamental purposes. It is of a dark-green color, mottled and streaked with white and black. The larger part of the stone obtained from the Holly Springs quarry is reported to have been shipped to Chicago, where it is used for interior decoration. Georgia serpentine used for similar purposes may be seen in the Prudential building of Atlanta.

Limestone.—Silurian and carboniferous limestones suitable for lime, fluxing and building materials, exist in great abundance in northwest Georgia. The most extensive of these calcareous formations is the Knox dolomite, a magnesian limestone of great thickness. This formation fur-

nishes much of the lime used in the State, as well as a large amount of stone for general building purposes. The different beds of the formation vary greatly in texture and chemical composition, so that almost any variety of stone can be procured. Other calcareous formations of scarcely less commercial importance are the Bangor and the Chickamauga limestones. The latter stone in the last few years has had an extensive use in constructing the foundations for monuments in the Chickamauga National Park. The stone is also of considerable local importance as a building material.

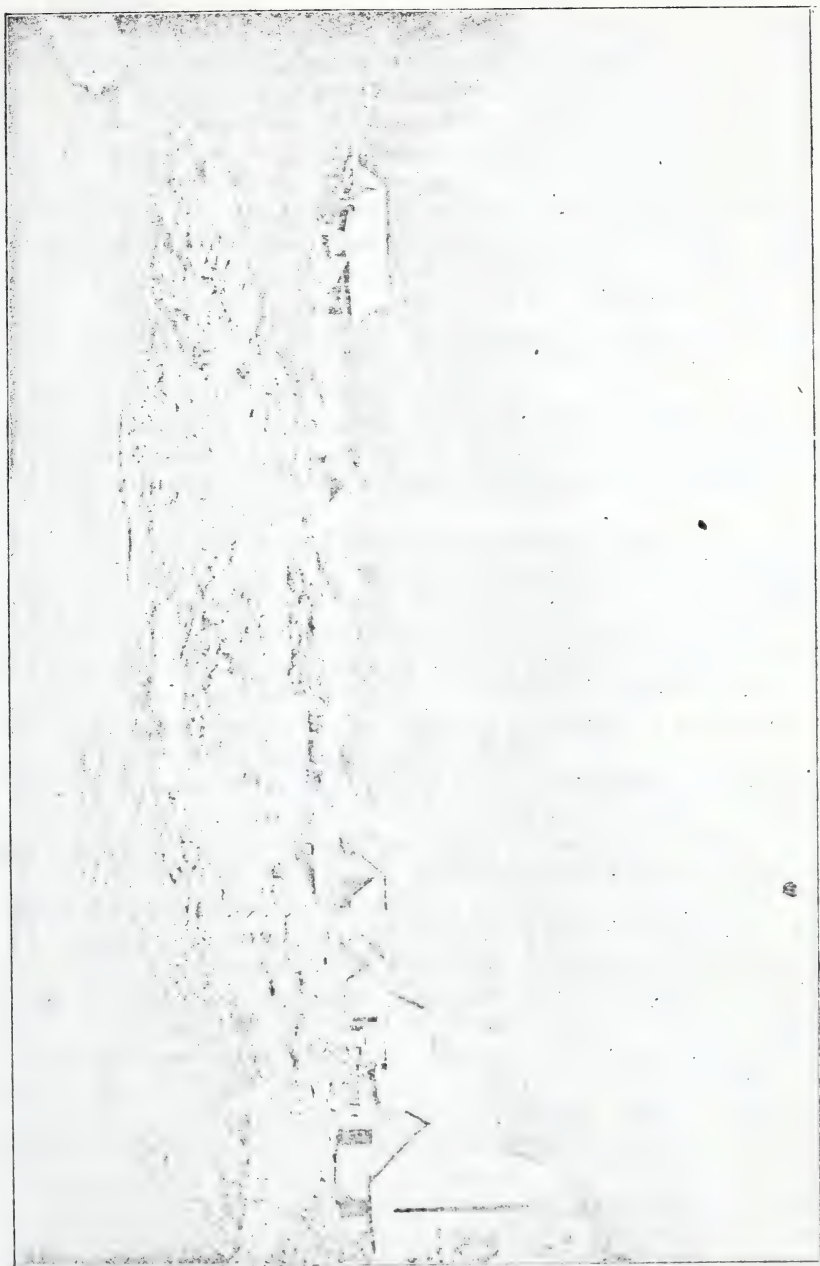
Cement Rock.—Hydraulic cement of good quality has been manufactured in Georgia since 1845. The location of this industry is at Cement, on the Western & Atlantic Railroad, in the western part of Bartow county. The cement rock found in this district is an impure magnesian limestone belonging probably to the lower division of the Knox dolomite formation. It occurs in beds several feet in thickness, intercalated with the purer limestones. The cement manufactured from this stone is slow setting, but it forms a bond of great strength and hardness. Maj. M. T. Singleton, late Assistant United States Engineer, in speaking of this cement says: "My experience with the cement has been entirely satisfactory. In fact, for general purposes, and especially for heavy cut stone masonry, I prefer it to any cement I have used."

Hydraulic limestone of good quality is reported at numerous other points throughout the Paleozoic area of North Georgia, but the extent and quality of the stone has not yet been investigated.

Slate.—Slate suitable for roofing purposes occurs at a number of points in northwest Georgia along the line of contact of the Paleozoic and Crystalline areas. The most important deposits are those of the Rockmart district in the eastern part of Polk county, where slate has been mined on a more or less extensive scale for a great many years. The Rockmart slate, which is of Silurian age, has a deep blue-black color and a fine, even texture. It splits with a smooth surface into thin slabs and is quite free from pyrites and other impurities. The chemical analysis of the Rockmart slate shows it to be a first-class stone for roofing purposes.

The only slate quarries now operated in Georgia are those in the vicinity of Rockmart. A few years ago a small amount of slate was quarried near Cedartown, but these quarries are now abandoned. The slate at the latter quarries belongs to the same formation as the Rockmart and is of similar character. The slate now being quarried in the Rockmart district is quite generally used throughout Georgia and a number of other Southern States, where it has a high reputation as a roofing slate.

Clays.—The clays of Georgia are abundant and widely distributed. There is scarcely a geological formation of any extent that does not furnish clays of commercial value. Residual and alluvial clays, well adapted to the manufacture of brick and the cheaper grades of crockery, abound in every county in the northern part of the State. Associated with these impure clays are often found pockets or irregular deposits of porcelain and fire clays of greater or less extent. The latter clays are



CORUNDUM MINE.

confined chiefly to the Knox dolomite formation of northwest Georgia, but they are also occasionally met with in the Crystalline area further to the east and south.

The most valuable and extensive clay deposits in the State are those of sedimentary origin belonging to the Cretaceous formation of central Georgia. They occur in a belt several miles wide, extending from Columbus to Augusta. The Cretaceous clays differ greatly in their physical and chemical properties, so that almost any desired variety may be found. Some of these clays have an extensive use in the manufacture of wall-paper, while other varieties are used in making porcelain, terra-cotta, tiling, sewer-pipe, pottery, etc. Besides the varieties of clays here mentioned, fire-clay also occurs in the Cretaceous formation in commercial quantities. Dr. George E. Ladd, Director of the Missouri School of Mines, in speaking of the Cretaceous fire-clays of Georgia, says: "Some of these kaolins suitable for fire-clays are more refractory than any of the noted fire-clays of the United States."

The clay industry of Georgia, although in its infancy, has already become well established. The value of the clay product of the State last year exceeded that of any of the Southern States, with the exception of West Virginia and Maryland.

Gold.—Gold has been mined in Georgia for nearly three quarters of a century. The first discovery of the precious metal within the limits of the State was made on Duke's creek, White county, in 1829. Previous to the discovery of gold in California, the mines of Georgia furnished the greater part of the gold produced in the United States. As early as 1838, the output of the mines of the State had become so important that the United States government found it necessary to establish a mint at Dahlonega, the center of the main gold-mining district.

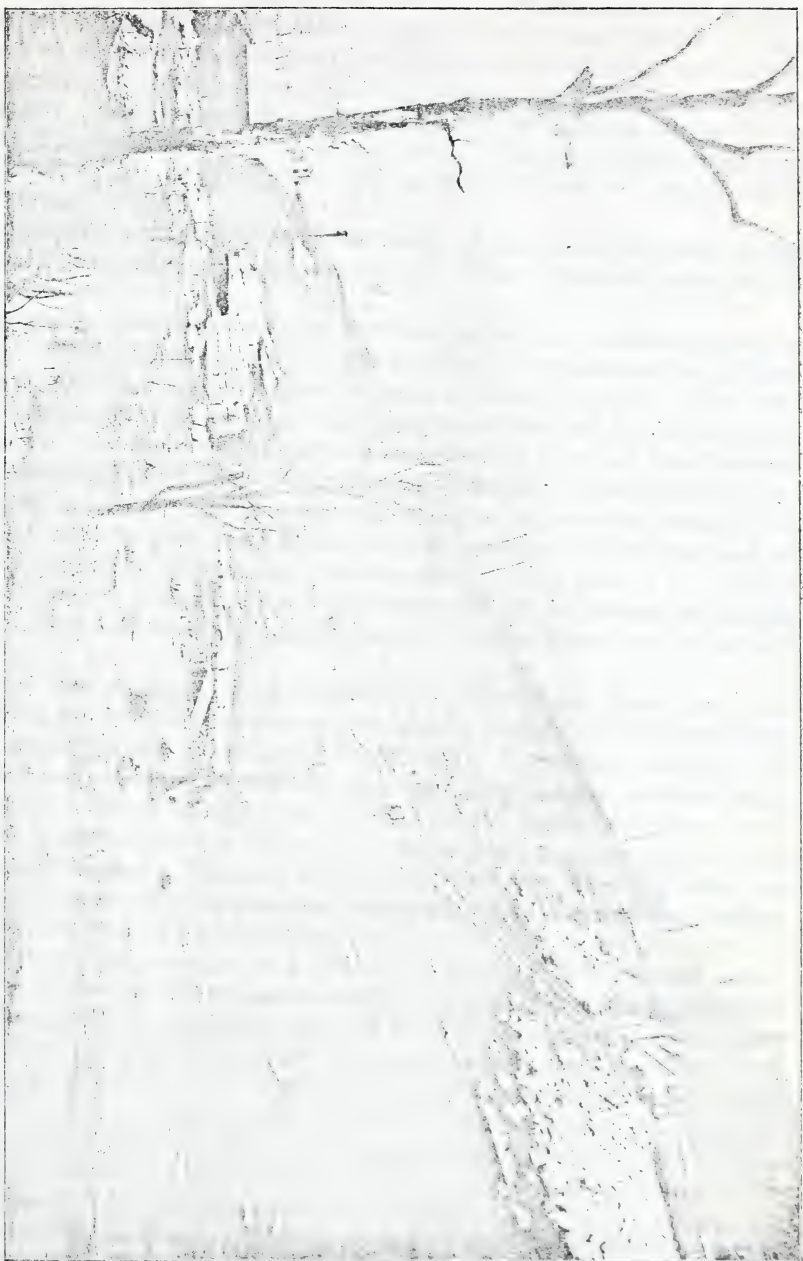
The gold deposits of Georgia belong to the Appalachian gold fields, an auriferous belt extending from Nova Scotia to Alabama. The belt, which consists of highly Crystalline rocks, probably of Archean age, varies in width from 10 to 75 miles. In Georgia, the belt breaks up into a number of minor parallel belts, having a northeast-southwest trend. The most important of these are the Dahlonega and Hall county belts. The former, which takes its name from Dahlonega, the county seat of Lumpkin county, is the most important. This belt enters Georgia from North Carolina in the northwestern part of Rabun county, where valuable placer deposits have been worked at the Smith and the Moore Girls' mines. Further to the southwest in White county, the belt increases in width and the mines at the same time become more numerous. As the auriferous belt enters Lumpkin county it again increases in size, reaching its greatest development in the vicinity of Dahlonega. In Dawson county the Dahlonega gold belt becomes more or less broken up, but upon entering Cherokee county it again regains its economic importance and continues with but few interruptions through Bartow, Cobb, Paulding and Haralson counties to the Georgia-Alabama State line. The entire length of the Dahlonega gold belt thus outlined is about 150 miles, while its width varies from 1 to 5 miles.

The Hall county gold belt lies some 10 miles east of the Dahlonega belt and runs more or less parallel with it for more than 100 miles, stopping short in Fulton county, only about 10 miles north of Atlanta. A third belt, which includes the Aeworth, the Villa Rica and the Bonner mines, traverses Cobb, Paulding and Carroll counties. This belt is best developed in the neighborhood of Villa Rica, where in former years much gold was mined. Another belt, including some very important mines, traverses Lincoln, Columbia, McDuffie and Warren counties in the eastern part of the State. Beyond the limits of the belts here mentioned are found a number of isolated localities where gold occurs in paying quantities. Such isolated deposits as here referred to are found in Towns, Union, Fannin, Gilmer, Meriwether, and other counties in the northern part of the State.

The individual auriferous belts of Georgia are usually made up of a great number of veins or ore bodies running parallel to each other and conforming in dip and strike to the gneisses and schists, the country rock. They vary in thickness from a fraction of an inch to several feet or rods, and often continue without interruption for long distances. In places the veins, which consist largely of quartz, become greatly extended, forming huge shoots of excellent ore. A vein of this character at the Creighton mine in Cherokee county has been worked continuously for years and has produced large quantities of gold. Ore bodies of somewhat similar nature are quite abundant in the Dahlonega district where in the last two years extensive developments have been carried on which, no doubt, will soon result in a large increase of the gold output of the State.

Copper.—Previous to the Civil War copper was successfully mined in Fannin and Cherokee counties in the northern part of the State. The deposits of the former county are located near the Georgia-Tennessee line, and from the southern extension of the deposits so largely worked just across the State line in the Ducktown district. One of the Fannin county mines, known as the Mobile mine, at one time was quite extensively worked and is said to have produced a large amount of high-grade ore. The copper deposits of Fannin county, although practically undeveloped at present, are thought to be of considerable economic importance. Other copper deposits which, from time to time, have excited considerable local interest, occur in Fulton, Paulding, Lumpkin, Haralson, Lincoln, and other counties in North Georgia. The most important copper ore met with in the counties here named is chalcopyrite (copper pyrites). It occurs mostly in irregular veins associated with schists and highly metamorphic slates.

Pyrite.—Pyrite, an iron sulphide employed in the manufacture of sulphuric acid, is widely distributed throughout Georgia, but only in a few localities has it been found in sufficient abundance to be of commercial importance. Probably one of the most important deposits of this mineral known at present in the State, occurs in the eastern part of Lumpkin county, on the Chestatee river, about six miles northeast of Dahlonega. This deposit is quite extensive and the ore is of good quality. The com-



SOUTHERN MARBLE YARD AND QUARRY, PICKENS COUNTY.

mercial value of the deposit has long been known, but the great expense of hauling the ore by wagon to Gainesville, the nearest railway station, twenty miles distant, renders the mining of the ore unprofitable. Other deposits of pyrite of considerable promise occur in Paulding and Haralson counties. The deposit in Paulding county was worked to some extent a few years ago and the ore was shipped to Atlanta where it was used in the manufacture of sulphuric acid. This ore, which runs high in sulphur, is said to carry from four to five per cent. of copper and a small amount of gold.

No systematic study has yet been made of the pyrite deposits of the State, and as a consequence little is known of their extent and commercial importance.

Soapstone.—Soapstone, or talc, has been mined to a limited extent in Murray and Fannin counties. It also occurs in Cherokee and in Gilmer counties, and is reported in other localities in North Georgia. The soapstone mines of Fannin county, which have been worked for some years, are located at Mineral Bluff, only a short distance south of the Georgia-North Carolina State line. This deposit is probably the southern extension of the North Carolina deposit which is extensively worked just north of the State line. The Fannin county soapstone is compact and of a dark gray or blue color. It occurs in veins varying from a few inches to a yard or more in thickness. The Murray county soapstones, which are found on Fort mountain, a few miles east of Spring Place, are of similar nature.

Mica.—This mineral is quite generally distributed throughout the Crystalline area of North Georgia. It usually occurs in veins associated with pegmatites and coarse-grained granites. The veins are often of large size, and occasionally contain mica crystals eighteen inches or more in diameter. Many of the mica deposits of the State have been prospected to a limited extent, but no systematic mining of any importance has been attempted. There is little doubt, however, that the mica deposits of Georgia are of commercial importance and demand more attention than they have heretofore received.

Graphite.—Both massive and foliated varieties of this mineral occur in considerable quantities associated with the highly metamorphic slates and schists along the western margin of the Crystalline area. It is quite abundant in the neighborhood of Emerson, Bartow county, where it is now mined and used in the crude state as a filler for commercial fertilizers. Promising prospects of graphite are also reported to occur in Pickens, Elbert, Hall, Madison, Douglas and Cobb counties. The Pickens county deposit is at present being developed and it is thought that in a short time it will become an active producer.

Marls.—Marls of good quality abound throughout the cretaceous and tertiary formations of South Georgia. There is probably no county in the southern part of the State which does not possess marl deposits of more or less agricultural value. They are well exposed along the Chattahoochee and Flint rivers, as well as along other streams of South Georgia. In addition to the common calcareous or shell marl, green

sand marls are also plentiful. The latter are especially well developed along the Chattahoochee river south of Columbus, where they often form beds many feet in thickness. Analyses of these greenlands show that they carry a considerable amount of phosphoric acid and potash, two of the most important plant-foods. The use of the Georgia marls as a natural fertilizer has so far been quite limited, but in all cases where they have been given a fair test the result has been entirely satisfactory. Associated with the marls in the extreme southern part of the State frequently occur deposits of phosphate of limited extent. A deposit of this character was worked some years ago in Thomas county, near Boston, but the phosphate was not of sufficient abundance to be of commercial value.

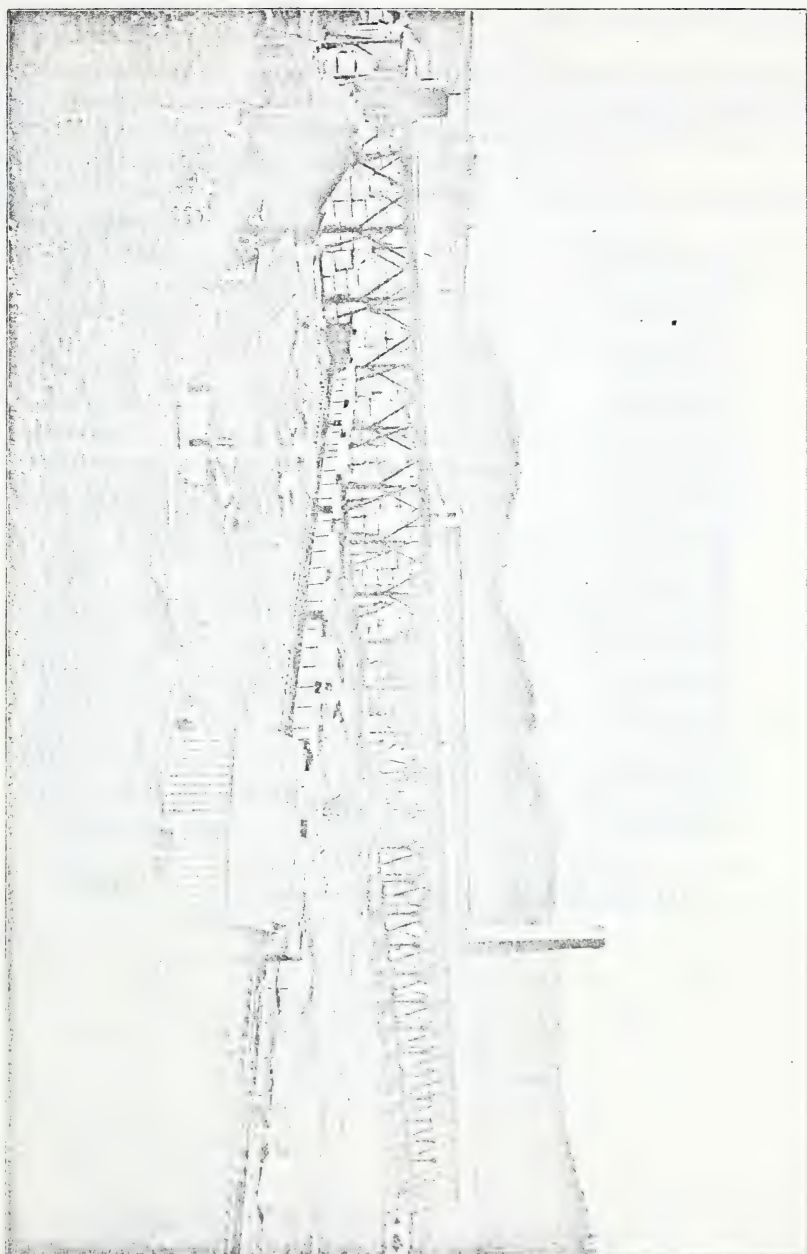
Tripoli.—A light, porous, silicious stone occurring in Murray, Chattooga, and other counties in Northwest Georgia has locally been known for some years as tripoli. The material, although quite different in origin from tripoli, has a similar use in the arts. The so-called Georgia tripoli, is a residual product derived from certain impure silicious beds of the Knox dolomite formation. The stone, which is usually found associated with chert, is quite porous and is easily pulverized into an exceedingly fine grit or polishing powder. A small amount of this material is at present being mined in Chattooga county, and is used by an Atlanta firm in the manufacture of polishing-soap.

Sand.—Sand suitable for building material is widely distributed throughout the State. In North Georgia it occurs chiefly as alluvial deposits along the numerous streams, while in the southern part of the State it is found in stratified beds often of wide extent. In addition to that used for general architectural purposes, sand well adapted for moulding and glass-making also occurs. The pure sands are confined mainly to the cretaceous deposits of South Georgia, where they are frequently intercalated with beds of pure kaolin.

Road Materials.—There is probably no State in the South that has a greater variety of road materials than Georgia. The supply is inexhaustible and of the best quality. Besides the limestones, granites, and gneisses, heretofore spoken of, trap, diorite, chert, and gravel abound in great quantities.

Mineral Waters.—The number of mineral springs in Georgia to which public attention has been directed on account of the medicinal properties of their waters is very large. There is scarcely a county in the northern part of the State which does not possess one or more of these springs of greater or less repute. Many of them are so far only of local interest, but in some instances they have a national reputation, and are a source of much profit to their owners.

The commercial value of the mineral waters of Georgia in the last few years has exceeded that of any other Southern State with the exception of Virginia. The main supply of these waters now put upon the market is shipped from Lithia and Austell, a noted mineral water district on the Southern Railway, twenty miles west of Atlanta. The waters shipped from the Lithia-Austell district are among the best lithia waters found in the country. Their curative virtues are widely known and they are



GEORGIA MARBLE WORKS, TATE, GA.

now shipped to all parts of the south in large quantities. Other springs having an excellent local reputation occur in North Georgia, but only in a few instances is the water put upon the market.

Besides the minerals above described there are many others found in Georgia which, at some future time, will probably become a source of revenue to the State. Among the most important of these may be mentioned silver, lead, zinc, baryta, gypsum, etc.

The annual output of the mineral products of Georgia is shown by the following table:

Iron Ores	\$ 578,526 00
Coal	450,000 00
Manganese	60,201 00
Ochre	73,095 00
Bauxite	35,274 00
Asbestos	10,300 00
Marble	812,070 00
Granites	790,000 00
Sandstone	2,000 00
Limestone and Lime	125,000 00
Cement-Rock	75,000 00
Slate	13,125 00
Clays—Brick, Pottery, &c	1,062,213 00
Gold	129,246 00
Soapstone	4,054 00
Graphite	12,000 00
Tripoli	500 00
Sand	200,000 00
Road Material and Ballast	350,000 00
Mineral Waters	42,000 00
Total	\$4,824,604 00"

CHAPTER IV.

SOILS OF GEORGIA.

The soils of Georgia, from a geological standpoint, were partially discussed in the last chapter. We shall now endeavor to look at them from the point of view of the agriculturist.

NORTHWEST GEORGIA.

The northwestern section of the State presents a variety of soils; as a brown and red loam; silicious soils of the ridges of a grayish-hue; the sandy soils of table or mountain lands, either gray or yellow, and more or less gravelly; the soil of the flatwoods; and the alluvial or bottom lands adjacent to streams. On the eastern and western sides of this section soils of a brown calcareous loam, belonging to the blue limestone area, prevail, while in the central parts is found a red calcareous loam of the rotten limestone area. Lands that have been in cultivation for thirty years will yield from thirty to fifty bushels of corn to the acre. By merely planting in clover or peas and turning the crop under without fertilization, the farmer can make these lands produce from ten to twenty bushels of wheat to the acre. They have been cultivated in cotton to only a limited extent, but will, under ordinary cultivation in Floyd and Polk counties, produce eight hundred pounds of seed cotton to the acre. Under the best methods the production can be greatly increased. These lands generally lie well. They are apt to wash when hilly, but this can be prevented by a good system of terracing. Very little cotton is grown to the north of Floyd county. The timber is large, consisting chiefly of red, spanish, and white oak, hickory, poplar, sugar-maple, post oak, cedar, and a mixture of other varieties. The brown loams vary from light to almost black, while the red loams are of a dark red color with red subsoil.

Subcarboniferous brown loam lands consist of limestones, arenaceous and silicious shales. They are generally rolling, but nearly level where the valleys are broad. They have a brown, calcareous, sandy soil, with enough clay to make them sufficiently retentive, and admit of good drainage even when nearly level. Lands of this character are found in West Armuchee valley in Walker county, Sugar valley in Gordon, Dirttown

valley in Chattooga, and Texas Valley in Floyd, about twelve miles northwest of Rome, and in much more of the country west of the Coosa in Floyd county. Not only do corn, wheat, oats and all the grasses and other forage plants do well, but these are also the best cotton uplands in this part of Georgia, yielding often without fertilizers from 1,000 to 1,200 pounds of seed cotton to the acre, and under the most scientific farming going far beyond that.

In sections of Northwest Georgia there occur lands in belts of from two to three miles in width, which are underlaid by a series of shales and limestones of about 2,500 feet in thickness, known as Knox shales. Nearly all this area consists of an orange, or light colored clayey soil. The lands are rolling, or nearly level, and have a good drainage. After having been steadily worked for thirty or more years under the old exhaustive methods, with almost nothing returned to the soil for improvement, they will produce, fairly well, wheat, oats, and corn. In the forests are found the usual timbers of this section with some dogwood and pine. Clover and all the grasses do well.

Gray gravelly lands, with a soil varying in color from light to dark gray, are also found in this section. Some of these gravelly lands have a good clay subsoil, and are then of a dark brown, or red color. Those nearest the valley lands are the most highly esteemed. They were once regarded as poor, and are in great part covered with original forests. The timber is about the same as already described, except that in broad belts of nearly level lands the short-leaf pine is the prevailing growth. But taking the whole area of the gravelly lands, oak predominates.

Instead of being the poor lands that they were formerly regarded, they have been found to give a better return for manures than the richer valley lands. They are profitable for cotton, and with the use of fertilizers will yield 1,200 pounds to the acre. Fruit trees here are healthy and long-lived. The tops and slopes of the ridges are less subject to late spring frosts than the lower lands.

The table-lands from 1,000 to 1,200 feet above the valleys are gray or yellow, and more or less gravelly, or rocky. They are found on Sand Mountain, in Dade county, and on Lookout Mountain, in Dade, Walker, and Chattooga counties. They are well adapted to fruit culture and produce a great variety of vegetables. The daily range of the thermometer is fifty per cent. less than in the valleys, and yet the daily minimum temperature is rarely more than two or three degrees less. The timber is of medium size. A good grass covers the surface nearly everywhere, affording excellent pasturage for stock.

The most extensive area of what is known as *flatwood lands* is near

the Oostanaula and Coosa rivers, in Gordon, Floyd, and Polk counties, and in a belt of hills in the southern part of Murray county, extending southward nearly across the county of Gordon. They are also found in Catoosa in a narrow belt extending southward into Whitfield. These flatwoods abound in short-leaf pine, post and red oaks.

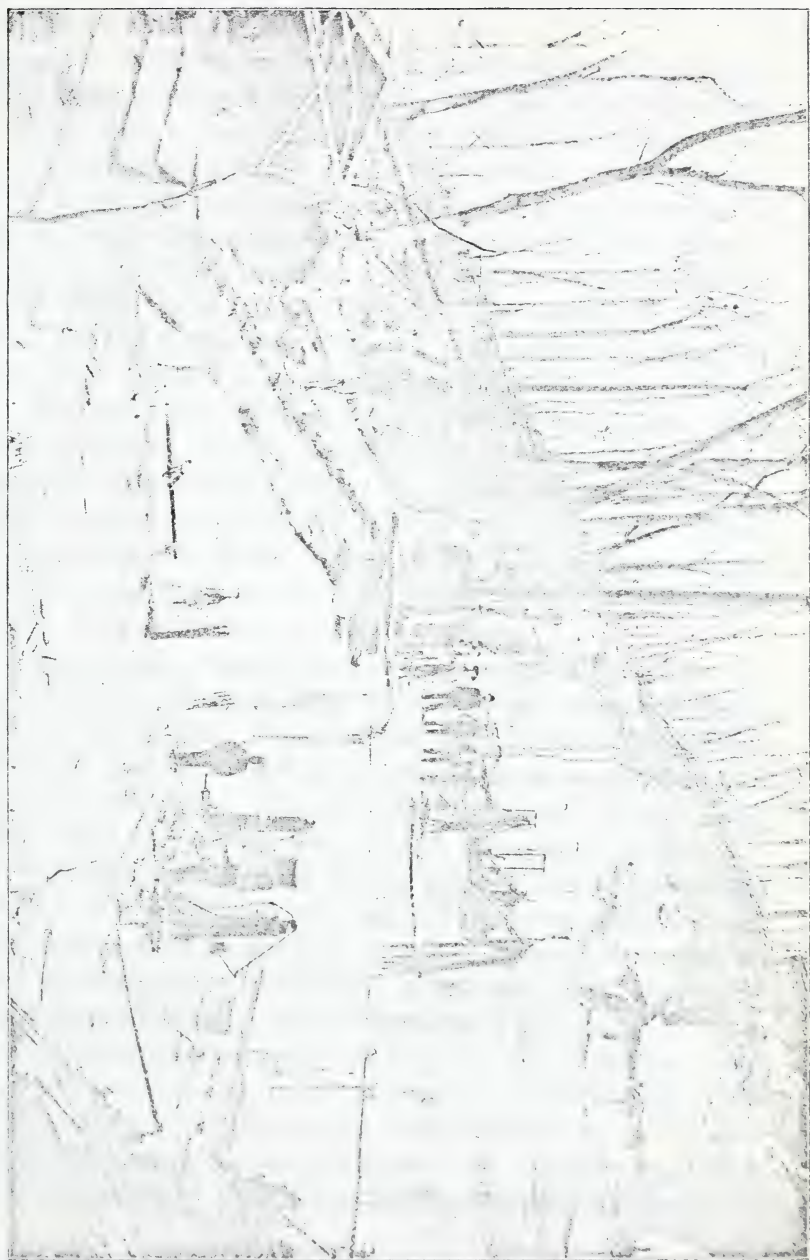
The alluvial soil of the valleys of the Oostanaula, Etowah and Coosa rivers, fertile with the débris of ages, is capable of producing the finest yields of corn, wheat, oats, rye, barley, buckwheat, cow-peas, clover, timothy, orchard grass, red top, in fact, all the most useful hay crops.

Near the city of Rome forty acres planted in clover, which averaged when mature, three feet in height, have been known to produce in one season 200 tons of hay, or five tons to the acre. This shows what can be done on this line. The clover crop may be cut three times annually.

The finest grade of upland cotton grown in America is produced on this soil, and is considered in Liverpool the best of its variety. All this is true, also, of the creek bottom lands. The higher or table-lands of Northwest Georgia are somewhat less fertile, but better adapted to the growing of such fruits as peaches, plums, pears, quinces, cherries, and all kinds of berries. The best apples grow on the lower lands, where large, magnificent old trees grow to perfection. On the mountain tops and slopes, all the varieties of grapes that grow east of the Rockies flourish and give abundant yield. On these heights the frost seldom kills the bud, or nips the bloom of the peach. Often, when the lower lands have little or no fruit, these sun-kissed hills smile in plenty and gladden the heart of man.

In Northwest Georgia can be found almost every species of wood known in the Southern States. The oaks and pines predominate. Of the former, there are six varieties, red, white, mountain or chestnut, black, water and post-oak; and of pine there are two varieties, long and short-leaf. Thousands of acres of these valuable timbers can still be found, and can be bought at reasonable prices. There are also found poplar, ash, beech, elm, chestnut, hickory, maple, walnut, iron-wood, sugar berry, sycamore, sweet-gum, black-gum, dogwood, persimmon, sassafras, wild cherry, redbud, warhoo and cedar. Many of these are found in large quantities and can be utilized in the manufacture of furniture and hardwood finish for dwellings. The oaks and pines are for the most part used in buildings, furniture, and in the manufacture of farming utensils, wagons, etc. Large quantities of the oak and pine are annually shipped.

The indigenous grasses of this section are: Bermuda, Johnson, crab, perennial Paspalum, and annual or drop seed Paspalum. These all make splendid pasturage and the best of hay.



MARBLE QUARRY SCENE, PICKENS COUNTY.

SOILS OF MIDDLE AND NORTHEAST GEORGIA.

The red hills of Georgia are familiar to all who have traveled through these sections by rail or wagon-road.

In the phrase *red lands* are included both red sandy and red clayey soils. The decomposition of hornblendic rocks form a red clayey soil, which, though more or less sandy for a few inches, has a deep red-clay subsoil. The color and character of the soil varies of course in proportion to the hornblende and other minerals associated in the rocks. If biotite mica, which contains much iron, is present to any great extent in the soil, its decomposition produces a deep mulatto, or sometimes red soil similar to that from hornblendic rocks, but usually of a lighter character. Though the surface of the red land country is rolling and often quite hilly with few level areas, very little is too broken for cultivation. The forest trees of these lands are red or Spanish oak, white and post-oaks, hickory, chestnut, dogwood, and, in the lowlands of some of the counties, short-leaf pine, poplar, ash, walnut, cherry and buckeye. There is more hickory and less pine than on gray sandy land. Black-jack is interspersed with these. Except in the more southern counties these lands are considered best for small grains, though about one-third part of those under cultivation is devoted to cotton.

Where *gray, sandy, gravelly land* occurs, though much of the surface is more or less rolling and hilly, there are broad level areas on the ridges and in the valleys. Except in the more mountainous districts the slopes of the hills and ridges are so gradual as not to interfere with their successful cultivation. Though their light, sandy nature makes them liable, when under cultivation, to wash into gullies and flood the lowlands with sand, such damage can be prevented by the prevailing method of hill-side ditching or terracing. These gray sandy soils are frequently colored dark for an inch or two with decayed vegetation. Then from the intermixture of the dark soil and the yellow, clayey subsoil there is obtained what is commonly called a mulatto soil. These lands are considered better than the red clays for cotton, because under favorable conditions they are more productive. They are also more easily tilled, although often loose quartz rocks, or stones, are so abundant that they must be removed before the ground can be broken up. From one half to two thirds of these lands under cultivation are devoted to cotton.

In the *granitic lands* the soil is often a coarse, gray, or gravelly sand, from three to six inches deep, with a more or less sandy subsoil of red or yellow clay. Ninety-eight per cent. of the granite lands are in the

main good and easily tilled, yielding about 800 pounds of seed cotton to the acre, when fresh and unmanured. Almost everywhere in these lands the timber is pine, either long or short-leaf, oak, chestnut, hickory and some black-jack. One feature of these soils worthy of note is their superiority over other metamorphic soils in both potash and lime, derived doubtless from the feldspar of the granite. In the mountainous Blue Ridge region, especially in Towns and Rabun counties, but little of this land is tillable except along the watercourses. In ten counties of the northeast section only a little over 12 per cent. of the area is under cultivation owing chiefly to the fact that that part of Georgia is as yet but thinly settled. The tillable lands have a very rich, dark red soil. Little Tennessee valley, in Rabun, is noted for fertility. Nacoochee valley, in White county, is famous as one of the most beautiful and productive in the State. Wheat and other small grains, corn, the choicest of fruits and vegetables, flourish luxuriantly. The rich grasses are of the very best for stock, and the beef, lambs, kids and veal, are as fat and nice as one could desire. Honey, butter, eggs, and chickens are abundant and can be had at reasonable prices. The forests are filled with the best timber. There are also to be seen beautiful flower gardens, summer houses and fountains, artificial lakes, parks for deer and pools for fishes.

The valley lands of the Tugaloo, Middle, Hudson and Soque rivers are productive of the best wheat and corn. Around Cornelia, in Habersham county, the most luscious peaches and other fruits are grown.

As we go southward from the Blue Ridge counties, there is a steady increase in the acreage under cultivation, until we get to the pine hills of the central cotton region, where from 60 to 75 per cent. of the entire area is under cultivation. Of the lands north of the Chattahoochee, those to the northeast have almost entirely gray, sandy soils, with but few strips of red clay. German millet and buckwheat flourish in this section, and good tobacco can be successfully grown, as is proven by the patches raised here and there exclusively for home use. This section is well adapted to such fruits as the apple, cherry, pear, grape, all varieties of plums, the peach, and to the gooseberry, raspberry, strawberry, blackberry and dewberry.

The Middle Georgia region was the first settled after the coast country and is the most populous section of the State. All the largest cities of the State, except Savannah, are in this belt. All through this section, whose lands are for the most part, of the red clay soil, cotton, corn, oats, wheat, and the other small grains, peas and all the grasses do well. Tobacco also can be successfully grown. Though injudicious culture for a

long time injured the soil, fields that had been abandoned and left to grow up in weeds have, after years of rest, under judicious cultivation, regained their fertility, and are once more among the best lands of Georgia. To give some idea of what may be done under wise management of the soil, we cite just a few examples.

On one farm in Hancock county, the first year after the sod of Bermuda grass was broken, there were gathered 1,800 pounds of seed cotton to the acre, and the second year 2,800 pounds to the acre. In each case this was without fertilizing. A third crop, corn manured with cottonseed in the usual manner and quantity, yielded sixty-five bushels to the acre. The fourth year the crop on this ground was wheat, and without fertilizing it yielded forty-two bushels to the acre. In Spalding county wheat has often yielded forty bushels and sometimes sixty to sixty-five bushels to the acre, and as much as 10,726 pounds of hay have been gathered on one acre in one season. In Bibb county 8,646 pounds of crab grass hay have been harvested on one acre in a season.

To show what "worn-out" land can be made to do, we give the example of Mr. Samuel Bailey. In 1868 he purchased a place in Oglethorpe county which every one considered almost worthless for farming purposes. The first year he cultivated only sixteen acres, ploughing deep and subsoiling, and leveling all washes as near as possible. He sowed one acre in wheat and fifteen in cotton. From his acre of wheat he gathered fifty-seven bushels, and from his fifteen acres in cotton he obtained eleven bales weighing 465 pounds each. He always advocated deep culture and thorough preparation of the lands before planting, more especially when manuring highly, either with barn-yard or commercial manure. He gave special attention to the drainage of land, stopping all washes. He used the manures manufactured at the Oglethorpe Fertilizing Works. He expressed the conviction, however, that barn-yard and cotton seed manures were more lasting. By saving all manures accumulated on his place, he brought his lands up to such a state of cultivation, that in an ordinary crop year without the aid of manuring, they would produce on an average from thirty-five to forty bushels of wheat, and one bale of cotton to the acre. He also grew all kinds of vegetables for family use, and sold annually Irish potatoes, onions and watermelons. He met with the best results in all kinds of fruits, such as peaches, pears, apples and strawberries. From one-eighth of an acre he has gathered twenty-eight bushels of strawberries of a superb variety (the Wilson Albany).

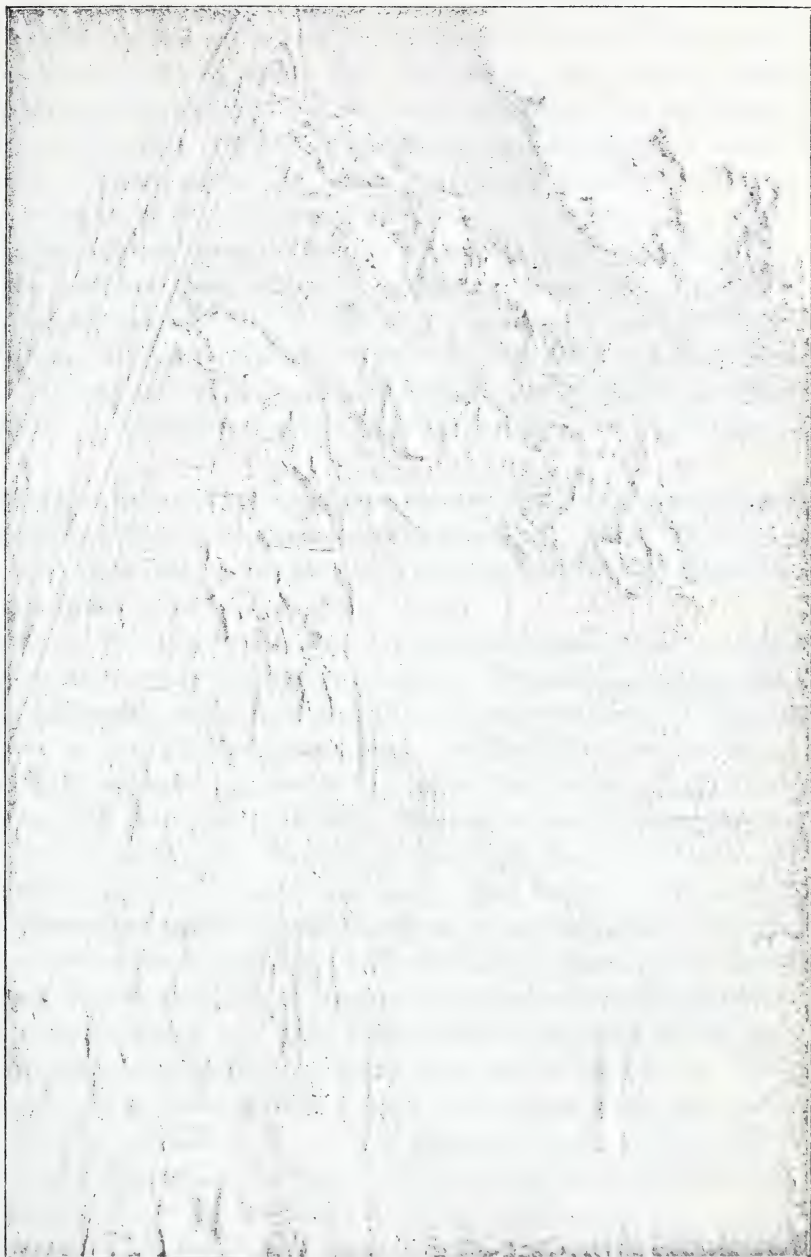
Another instance: In 1872 W. J. Born, in Gwinnett county, bought twenty acres of land that had been abandoned for years. This land had

gone to waste, and the twenty-acre plot was filled with gullies from five to ten feet deep, and some of them from five to ten feet wide. There appeared to be no soil, and all the humus was practically gone. Immediately upon the purchase of this plot of ground Mr. Born filled these gullies and waste places with pine brush cut from a neighboring field, hauled and scattered many loads of pine needles and oak leaves, using a two-horse plow, plowed and re-plowed this land, and leveled as best he could. Then he strewed broadcast the twenty-acre field with stable and barnyard manure, re-plowed, harrowed and rolled again. He then sowed it down in oats, and used two tons of commercial fertilizers, turned these oats under, harrowed and rolled again. The following spring these oats were mowed while in the "dough" state for hay, getting a fairly good crop of oat hay. He again fertilized heavily with barnyard manure and some commercial fertilizers, and sowed peas immediately after taking off the oat hay. In the fall the peavines were turned under and again oats were sown, using a liberal quantity of manure. This process was continued until the fourth year, when he planted this twenty-acre plot in cotton, and made twenty bales. This land was purchased for five dollars an acre. At the end of the fifth year it had been brought to a high state of cultivation, and instead of being worth five dollars could have been easily sold for twenty-five dollars per acre. This land had a red clay foundation. What Mr. Born did in 1872 has been done by others, and should be done by many more.

Throughout this whole section peaches, pears, apples, plums, cherries and other fruits, with all kinds of berries, abound. Its melons are without a superior. Among them the Augusta melon, so-called from its chief shipping point, takes high rank. All along the lines of railway from the northeast section down through Middle and Southern Georgia are extensive tracts devoted to grape culture.

SOILS OF SOUTHERN GEORGIA.

The central cotton region of the State includes the southern part of Middle Georgia, and large areas of Southern Georgia. It embraces three distinct belts having well marked differences. The first of these is the *sand and pine hills belt*. Its northern limit is a line running from northeast to southwest as follows: from a few miles north of Augusta and Thomson ranging a few miles south of Warrenton and Sparta to Milledgeville, Macon, Knoxville, Geneva and Columbus. At this point the metamorphic rocks are found outcropping in the beds of the streams, while the sand hills extend northward a short distance along the uplands.



MARBLE BLUFF, GILMER COUNTY.

The southern limit of the sand and pine hills belt is clearly marked by the somewhat abrupt appearance of the red clay hills along its border. The width of this belt varies greatly, being rather narrow in the part of it lying between the Ogeechee and Flint rivers, and greatest within twenty-five or thirty miles of the Savannah on the east, and the Chattahoochee on the west. Its southern limit on the Chattahoochee is near the mouth of Upatoi creek. In Taylor and Marion counties it widens to twenty miles or more. The area embraced in the sand hills is 2,950 square miles, the surface of the country being high and rolling, especially along the northern limit, where the altitude is from 500 to 600 feet above the sea, and from 100 to 150 feet above the adjacent metamorphic region. In some localities, as between the Flint and Ocmulgee rivers, the lower part of the belt is a broad plateau gradually declining southward. In the western portion the transition to the red hills is gradual.

As might be inferred from its name, the soil of this belt is sandy, and the prevailing timber pines, both long and short-leaf. There is also some scrub black-jack, oak, sweet-gums and dogwood, with an undergrowth along the streams of bay and gallberry bushes.

The second belt is the *red hills*. This belt is characterized by a high rolling, or broken and well-timbered surface. The lands are of red clay, associated generally with silicious shell rocks, and are found in isolated areas over the entire yellow loam region. At Shell Bluff, on the Savannah river, the beds are sixty feet thick, and at Fort Gaines, on the Chattahoochee, fifty feet. Between these two points their thickness diminishes to ten or twenty feet near the divide of the Central Atlantic and Gulf waters. The soil is somewhat sandy, from twelve to twenty-four inches deep in the eastern counties and six to twelve inches in others, with a subsoil of heavy clay loam, stiff and hard to break up, of deeper color than the soil, overlying at times a variegated and elastic pipe-clay. Between the Savannah and Flint rivers are the best lands of this belt, more productive and durable, and easily tilled, and in large areas. They yield from 800 to 1,000 pounds of seed cotton when fresh, and under proper culture continue to do so. The timbers are oak, hickory, short-leaf pine and dogwood, with beech, maple and poplar on the lowlands. Small grain is one of the best crops for these lands.

The third belt is the *Yellow Loam Region*, or the *oak*, hickory and long-leaf pine hills, with soils sandy and gray, but dark on the immediate surface from decayed vegetation, with a subsoil of yellow clay-loam or yellow sand, at a depth of from three to nine inches from the surface. This belt extends across the State from east to west. In width it

varies, in some parts reaching from the sand hills south to the pine and wire-grass region, and in others from the red hills southward to the same limit. In Houston county these lands are found north of the red hills.

The entire area embraced by the yellow loam region and red hills is 6,650 square miles. The names given to this belt indicate the character of its growth and soil. The lands are well drained and easy to cultivate, and yield an average of 500 pounds of seed cotton to the acre.

The Southern Oak, Hickory and Pine Region comprises portions of the counties of Decatur, Thomas and Brooks, lying along and near the Florida line. This region is for the most part rolling, about seventy-five feet above the wire-grass country on the north of it or 130 feet above the Flint river. From a point seven miles south of Bainbridge the ascent, eastward to Attapulgus and northward by Climax, is quite abrupt. But farther to the east it gradually merges into the wire-grass. The area of this section is about 2,317 square miles. The surface of the country is generally open with a growth of tall, long-leaf pine, where the soil is sandy with generally a clayey subsoil, underlaid by white limestone; but in some localities, where there is a red clay loam, the timber is oak and hickory.

One feature of this region is the rare appearance of wire-grass, and the almost total absence of silicious shell rocks, except in some lowlands.

The yield under ordinary cultivation is reported at from 600 to 800 pounds of seed cotton to the acre.

The lowlands of the Central Belt comprise the bottoms and hummocks of the streams and gallberry flats. On the Chattahoochee river there is but little bottom land, because the uplands approach to the water's edge as bluffs. The soil is a dark loam, more or less sandy, red on some of the streams, and from one foot to six feet deep, down to a tenacious pipe-clay. On some of the other large streams the bottom lands proper, which vary in width from 200 to 1,500 yards, when cultivated, are devoted to corn and oats, for the reason that cotton crops on these lands are liable to injury from early frosts and wet.

The hummocks, or second bottoms, of the larger streams above overflow are well cultivated, and on some of the streams they are extensive, being very level, with a growth of pine and most of the hardwoods common to Georgia. The soil is a rich sandy loam, with a depth of from twelve to twenty-four inches, having in it much decayed vegetation, and is very productive. These hummock soils yield about 1,400 pounds of seed cotton to the acre when fresh, and from 800 to 1,000 pounds after a few year's cultivation; but under skillful management their original fertility can be pretty well maintained. The alluvial lands of the Sa-

vannah river have a growth of beech, white and water oaks, holly, bay, birch, mulberry, sycamore, cottonwood, hickory, ash and walnut. These lands have a soil which is a brown loam, mixed with mica scales and of a depth of from two to three feet. They are well adapted to cotton, corn and grain. Being very productive, they are largely under cultivation and yield 1,500 pounds of cottonseed on fresh land, and under the ordinary modes 5,000 pounds after a few years' cultivation.

Along the Chattahoochee from Columbus to Georgetown are level valleys of open prairies similar to the second bottom of other streams, but higher and without their growth. In Muscogee county these valleys are broad and open, with a fine sandy loam soil from five to twelve inches deep, and a heavy clay subsoil. Farther south where the blue clay marls approach the surface, the valleys are richer, and yield 800 to 1,200 pounds of seed cotton to the acre.

The long-leaf pine and wire-grass region covers a large part of Southern Georgia south of the oak and hickory and pine lands of the central cotton belt. The entire region is a vast plain very nearly level, except on the north, covered with long-leaf pine, and including in its area eighteen whole counties and large parts of others. The surface of the upper and western portions is somewhat rolling, being elevated from twenty-five to seventy-five feet above the streams, and from 200 to 500 feet above the sea. The northeastern and southwestern portions of this region, being underlaid with limestones, have a better class of soil, as may be known from the intermixture of oak and hickory with the long-leaf pine.

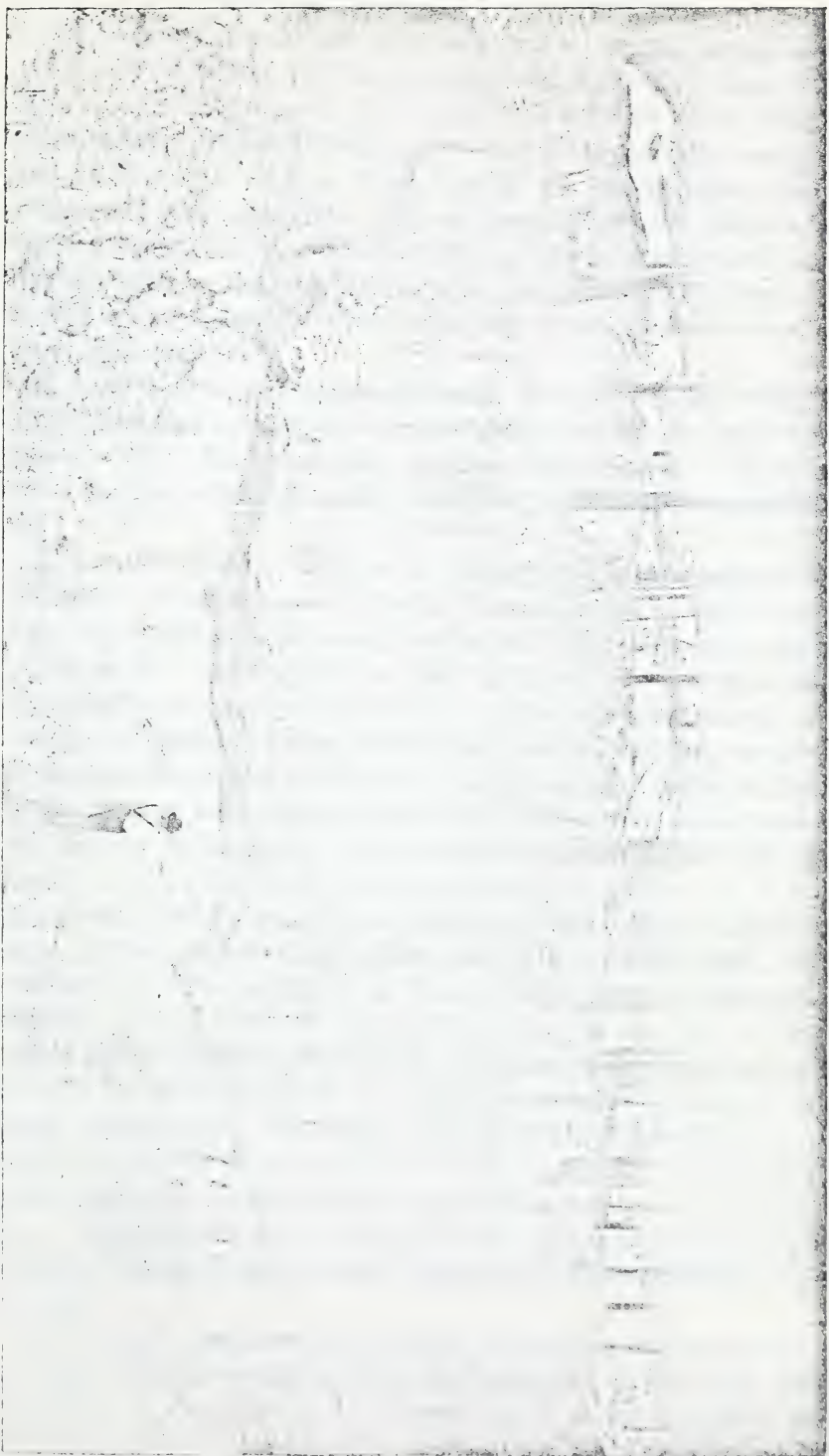
This region can be subdivided into two: the lime sink, and the pine woods region.

The lime sink region embraces 7,020 square miles, and includes the following counties and parts of counties: Screven, except a strip along the eastern and northern side of the county; the southern part of Burke; the northern part of Bulloch; all of Mitchell, Miller, Colquitt and Worth; the southern parts of Pulaski, Baker and Early, and the southern and eastern parts of Dougherty, the northern parts of Decatur, Thomas, Brooks and Lowndes; the eastern parts of Dooley and Lee; and the western parts of Irwin, Berrien, Dodge and Wilcox. The uplands of this region have a gray, sandy soil, from six to twelve inches deep, with a subsoil of red or yellow sandy clays, and yields about 500 or 800 pounds of seed cotton. The bottom or alluvial lands of the rivers and hummocks of the creeks have a dark loamy soil with a clay subsoil, at a depth of from ten to twenty inches. Being very durable they yield from 800 to 1,000 pounds of seed cotton to the acre, even

after many years of cultivation. Along the uplands oak is the principal timber, and on the bottom lands, white and red oaks, ash, hickory, poplar, beech, bays and magnolia.

The pine woods, or sandy wire-grass region covers an area of over 10,000 square miles, including the following counties and parts of counties: Tattnall, Montgomery, Emanuel, Telfair, Appling, Coffee, the middle of Effingham, the southern portions of Bulloch, Johnson and Laurens, the eastern parts of Wilcox, Irwin, Berrien and Lowndes, the upper portion of Pierce, Wayne, McIntosh, Liberty and Bryan, and portions of Jefferson, Washington, Dodge, Ware and Clinch. The surface is generally level, but sometimes slightly undulating, underlaid in some places by sandstone which, along the streams, juts out into bold bluffs. The soil is usually fine and sandy, with a subsoil of yellow sand, frequently underlaid with clay. This piney wire-grass region terminates near the coast, forming a terrace, from which there is a descent for fifteen or twenty-five feet to the Savannah and pine flat and palmetto lands. The soil of the uplands is sandy and gray, or ash-colored, twelve inches deep, with a subsoil of yellow or orange-colored loam, to which sometimes an underlying clay gives durability and vigor. These lands, when fresh, yield without fertilizers about 500 pounds of seed cotton to the acre, and sometimes more, and a judicious use of fertilizers keeps up this degree of productiveness. Corn, oats and sorghum-cane do well. On the low hills, where ferruginous concretions, commonly known as "Georgia pills," occur, other crops thrive better than cotton, which in those special localities is liable to rust. In bottom lands the soil is richer and colored almost black by decayed leaves and other vegetation, and the growth is poplar, cypress, and titi, with some pine and "fever tree" or "Georgia bark." The vast pine forests that cover this *pine woods region* are a source of great wealth to the State, and the trade in lumber has built up thriving towns. Wherever the timber lands are cleared, the land is being occupied and put under cultivation. The marls that abound in many parts of this section, when mixed with the muck from the swamps, afford a cheap fertilizer, which increases greatly the productiveness of the soil. This region opens a fine opportunity to the enterprise of truck-farming. Those desiring to engage in such business had better come while lands can be purchased at low rates.

The pine and palmetto flats lie in the southeastern corner of the State, around Okefinokee Swamp, and embrace mainly the counties of Charlton, Echols and Clinch, and large parts of Ware, Pierce and Wayne. This belt is considerably higher than that of the coast region, extending across other counties to the Savannah river.



LEWISTON WHITE CLAY BED, JONES COUNTY.

The country is level and open with many swamps, having a dense growth of titi, tupelo and black-gums, sweet and loblolly bays and cas-sino, a short-leaf pine, all interlocked with bamboo briers, forming a dense thicket. The chief timber growth is the long-leaf pine and cypress, and on the open lands a dense mass of low saw-palmetto, gallberry bushes and some wire-grass. This region is about 125 feet above the sea, the descent on the east being very rapid from Okefinokee Swamp to Traders' Hill, at the head of tide-water and Saint Mary's river. From thence is a level second terrace to the edge of the savanna covered with deep white sand.

The creek bottom and hummock lands, though not very wide, have a dark loam soil from eight to twelve inches deep with a clayey subsoil, beneath which lies a blue clay stratum. The growth of these hummock lands is in the main oaks, black-gum, tupelo-gum, cypress, maple, etc.

The coast region, covering in all about 2,045 square miles, includes savannas, live oak lands and islands. The "savannas," a belt of country from ten to fifteen miles wide, between the pine woods and wire-grass region on the one side, and the "live oak lands" on the other, extend from the Savannah to the Saint Mary's river, embracing nearly all the counties of Chatham, Bryan, Glynn and Camden, and large portions of Liberty and McIntosh. The surface of the country, known as the first terrace, is very level, standing from ten to fifteen feet above tide-water, and at some points higher. Its northwestern limit is the bluff of the second or wire-grass terrace, passing through the lower part of Effingham (twenty miles north of Savannah), into Bryan, where it is fifty feet high. At Savannah the bluff is forty feet above low-water mark. Southward through Liberty county, at "Gravel Hill," south of Hinesville, its elevation is from fifteen to twenty feet above the sea, and in Camden county fifteen miles east of Colerain, it is about twenty-five feet. Along the first or lower terrace of this region are meadow or savanna lands, broad, flat and open, with a sparse growth of tall long-leaf pines, and a thick undergrowth of saw-palmetto with here and there bunches of wire-grass which have found their way down from the upper or second terrace. In spring and early summer all over these broad extended plains beautiful flowers present to the delighted eye of the beholder a charming view.

The live oak and coast lands spread along the coast and occupy the numerous islands stretching from the Savannah to the Saint Mary's river, with an irregular and interrupted belt of yellow or mulatto sandy soil, characterized by magnificent live oaks, festooned with streamers of

gray moss often ten to fifteen feet long. There is also a growth of red and water oaks; hickory, chincapin, pine, red cedar, sweet-gum, cabbage palmetto, a tall variety of blue palmetto and sassafras. There are really three divisions of this live oak belt, viz.: upland or ridge, middle, and lower bottom lands, the last of which have a very rich dark soil, underlaid by a blue clay, well adapted to the celebrated black-seed or sea-island cotton. Not so much attention as formerly, however, is paid now to this long-staple cotton, since the use of fertilizers makes the upland or short-staple a more remunerative crop.

The coast tide swamp lands occupy a narrow belt, not continuous along the Atlantic coast, but bordering on the various inlets and streams to the limits of tide-water. Along the Savannah these lands are cultivated upward of twenty miles from the brackish marsh up the river. On the Altamaha their extent from the marshes upward does not exceed sixteen miles, because freshets prevent them from being of value except for timber. The soil along the Altamaha having more of decayed vegetable mold than that of the Savannah is more easily cultivated. The tide lands of the Ogeechee extend from the marshes about ten miles. Those of the Satilla, though not as broad as the others, extend from the marshes twenty miles up the river and are not liable to freshets. The swamp lands of the Georgia side of the St. Mary's river extend only to the foot of the second terrace some fifteen miles east of Colerain, though tide-water reaches Trader's Hill. The lands of this belt are the rice lands of the State, being devoted almost exclusively to its cultivation. Georgia's yield of this wholesome article of food is second to that of South Carolina, which State ranks next to Louisiana. Other crops do well, but rice is so much in demand that planters give to it the preference.

Of marsh land there is only a small area along the Georgia coast, at the mouths of some of the rivers.

The Sea Islands, which, large and small, form along the coast a network, with a rolling surface not exceeding fifteen feet above the tide, have a united area of 560 square miles. The soil is usually sandy, well adapted to the production of sea-island cotton, corn and sweet potatoes. In their delightful climate, sufficiently warm, and yet cooled by ocean breezes, lemons, figs, pomegranates, olives and oranges grow finely.

Finally in every part of Georgia are lands capable of the highest cultivation, with soils adapted to the very best results. If the settler desires to raise the various grains or grasses, the fleecy cotton, or the fruits found in every zone of production in the United States, from the hardy apple of the north to the tender orange of the tropics, he can choose his section of Georgia, buy his land and go to work with as much certainty of suc-

cess as in any other of the most favored parts of the Union. Fine Irish potatoes can be raised in Georgia, and no better sweet potatoes are anywhere produced. Again we would call attention to the fact that in addition to the various crops that have been mentioned in this description of soils, Middle and Southern Georgia are the home of the sugar-cane, richer in saccharine matter than any other plant from which sugar is extracted. No more charming farm scene meets the eye than a vast field of tasseled cane with all its promise of good things to come and future profits.

The ground-pea, which, when parched, is held in such high esteem, is produced extensively in Georgia. The chufa, though not so well known, is valued as good food for hogs.

Nor should we fail to name among other good products of Georgia soil the chestnuts, walnuts, hickory-nuts, chincapins and pecans, which help to give good cheer to the family circle as they gather on a winter eve before the hearth heaped up with blazing logs, or grate with glowing coal.

The mulberry tree should come in for a share of notice. This tree grows in every part of the State, especially in the sandy soil of some parts of Middle and Southern Georgia. The fruit of the black mulberry makes a very fattening food for hogs. The leaves of the white mulberry are the favorite food of the silkworm. When the colony of Georgia was founded it was intended that the production of raw silk should be one of its industries. Would it not pay some one who understands this business to embark in it in Georgia?

An excellent article of tea has been grown in Southeast Georgia.

Indigo grows wild in its southern section, and was at one time cultivated, until cotton absorbed almost all the attention of our people.

Peas and beans grow in every section of the State and the value of the cow or field-pea to all the cotton belt of Georgia, both for forage and soil fertilization, cannot be overestimated. The peas furnish excellent food for stock, and are good food for man as well, superior to the Boston bean. The hay made from the vines is of fine quality and very nourishing.

The reports that have been made on authority of the United States census concerning Georgia's soils give but a feeble conception of their productiveness. The authors of those reports in making up their averages for crops raised in the different belts, gave the results of the work of the unskilled laborers under overseers who were themselves ignorant of the best modes of cultivation. But skillful farmers using the best methods give us a fair idea of the capacity of Georgia soil in every section of the State. We give here some well authenticated yields:

In Cotton.—In Washington county, partly in Middle and partly in Southern Georgia, 6,917 pounds of seed cotton to the acre; in Troup county, Middle Georgia, 4,594 pounds; in Burke county, in the northern part of Southern Georgia, 4,500 pounds; in Carroll county, Middle Georgia, 4,500 pounds; in Crawford county, southeastern part, in Middle Georgia, 4,500 pounds; in Clay county, Southwestern Georgia, and Brooks, bordering on the Florida line, 2,700 pounds; in Coweta and DeKalb counties, in Middle Georgia, but both above the center of the State (DeKalb considerably so), 2,200 pounds.

In Corn.—In Spalding county, Middle Georgia, 137 bushels to the acre; in Cobb county, in the northwestern part of Middle Georgia, 125 bushels; in Wilkes county, Middle Georgia, 123 bushels; in Thomas county, Southwestern Georgia, bordering on the Florida line, 119 bushels; in Crawford county, partly in Middle partly in Southwestern Georgia, 115 bushels; in Cherokee county, in Middle Georgia belt, but northwestern part of the State, 104 bushels to the acre.

In Oats.—In Wilkes county, Middle Georgia, 137 bushels to the acre; in DeKalb county, Middle Georgia, 131 bushels; in Floyd county, Northwest Georgia, 121 bushels; in Coweta county, western Middle Georgia, 115 bushels; in Schley county, Southwestern Georgia, 100 bushels; in Brooks county, Southern Georgia, on the border of Florida, 75 bushels to the acre.

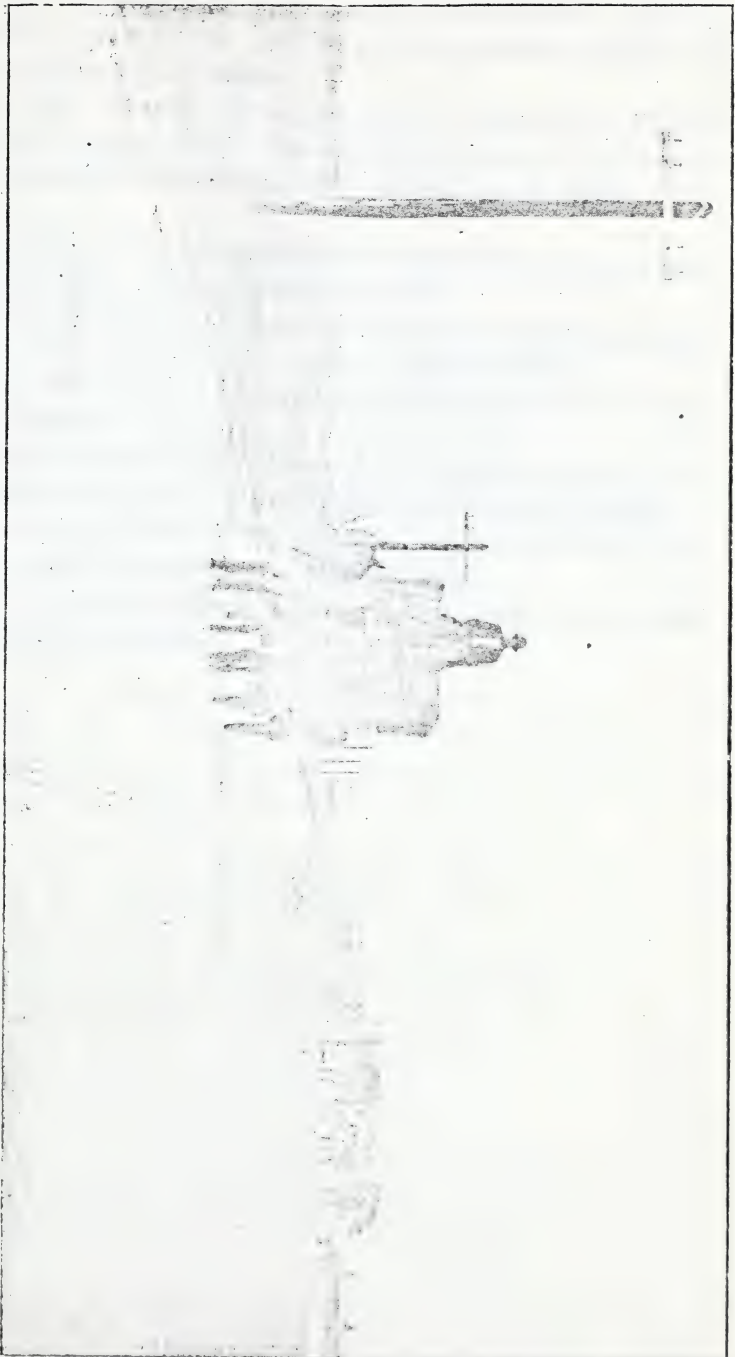
In Wheat.—In DeKalb and Spalding counties, Middle Georgia, 65 bushels to the acre; in Carroll county, Middle Georgia, 40 bushels; in Cherokee, Middle Georgia belt, but northwestern part of the State, in Milton next on the south, and Walton, Middle Georgia, 28 bushels to the acre.

In Sweet Potatoes.—800 bushels to the acre in Richmond, Crawford and Berrien counties, the first named being on the border of Middle and Southern Georgia and bordering on South Carolina, Crawford in Southwestern and Berrien in Southern Georgia, with but one county between it and the Florida line; 500 bushels in Brooks county, on the Florida border; 400 bushels in Fulton county, Middle Georgia belt but northwestern part of the State.

In Irish Potatoes.—Four hundred and twenty bushels to the acre in Wilkes county, Middle Georgia; 109 bushels in Walker county, extreme Northwestern Georgia.

In Upland Rice.—One hundred bushels to the acre in Hall and White counties, in Northeast Georgia; Pike, in Middle Georgia; and Early in lower Southwest Georgia on the Alabama line.

In Cane Syrup.—Seven hundred gallons to the acre in Bulloch



SAVANNAH VALLEY ROAD, RICHMOND COUNTY.

county, Southern Georgia; 695 gallons in Thomas county, in Southwest Georgia, on the Florida border; 600 gallons in Brooks county, Southern Georgia, on the Florida border; and 480 gallons in Burke county, in the northern part of Southern Georgia.

In Clover Hay.—Sixteen thousand pounds to the acre in DeKalb county, Middle Georgia; 10,000 pounds in Greene county, Middle Georgia; 6,575 pounds in Cobb county, northwestern part of Middle Georgia belt.

In Peavine Hay.—Ten thousand seven hundred and twenty pounds to the acre in Spalding county, Middle Georgia.

In Bermuda Grass Hay.—Thirteen thousand nine hundred and fifty-three pounds to the acre in Greene county, Middle Georgia.

In Lucerne.—Nine thousand four hundred pounds to the acre in Gordon county, Northwest Georgia.

In Crabb Grass Hay.—Eight thousand and forty-six pounds to the acre in Bibb county, on the border of Middle and Southern Georgia.

In Corn Forage.—Twenty-seven thousand one hundred and thirty pounds to the acre in Greene county, Middle Georgia.

In Sugar.—Twenty-one barrels to the acre in Bulloch county, northern part of Southern Georgia.

CHAPTER V.

PUBLIC ROADS IN GEORGIA.

RAILROADS AND WATER TRANSPORTATION.

In every county there should be good roads, on which the farmer can haul to the nearest market, or shipping point, the produce of his farm with the greatest degree of comfort to himself and the least possible wear on his wagons and stock. Roads must keep pace with all other improvements; for the public highways will have an important bearing on the judgment formed in regard to the thrift and enterprise of any county. Much interest in this subject has been aroused in Georgia for several years.

In 1891 a law was enacted authorizing commissioners of roads and revenues of each county, upon recommendation of the grand jury, to fix and levy a special road tax, not to exceed two mills on the dollar, and also to exact of each male inhabitant a commutation tax not to exceed fifty cents a day for the number of days' work required. The law also authorized authorities to organize chain-gangs of convicts, or to hire free labor for improvement and maintenance of public highways. The expenses were to be met by special road and commutation taxes. Many of the counties have adopted the new road law and every year adds to their number. The plan, on which the work is done, is to divide the force employed into squads, each of which consists of from fifteen to forty-five men under a competent superintendent and one or more overseers. Each squad is supplied with camping outfit, two or more road machines, wheeled scrapers, wagons, plows, and from ten to twenty mules. Usually on leading roads the working force first goes over them with machine giving proper crown, opening side ditches, macadamizing boggy places, and cutting down the grades of the steeper hills. In the case of less-important roads the force employed works them from one to two years. On the second working more attention is paid to grading and macadamizing. In counties having large cities, where from 100 to 400 convicts are employed, the roads are graded and macadamized at the first working. Under this system several hundred miles of first-class macadamized roads

have been built in several counties within the last three years. Among the best are the Manchester and Peachtree roads near Atlanta, thoroughfares equal to the best ideal. In this great work Fulton county leads all others, spending in 1900, \$140,000, and constructing many miles of well-graded macadamized road. Other roads of similar merit are found in Bibb, Floyd, Bartow, Richmond, Jefferson, Emanuel, Spalding, Meriwether and Chatham counties. The shell road from Savannah to Bonaventure and Thunderbolt was noted even before the civil war. The shell roads of Glynn county radiating from the city of Brunswick are also worthy of mention. From the city of Rome in Floyd county some of the finest macadamized roads in Georgia lead out in all directions. These roads of Floyd county cover more than seventy-six miles, and are built of hard limestone and marble. They are being added to at the rate of one mile a month. All of these roads are of easy grade and thoroughly drained. The county authorities expect to continue this system of road-building. In Bartow county there radiate from Cartersville in all directions splendid roads over which it is a delight to drive. The same is true of those of Richmond county, which center in Augusta, or those of Bibb, that form the favorite drives of the citizens of Macon. Thomas county has long enjoyed a good reputation for its well-graded drives through the fragrant pines. Ere many years at the present rate of progress all the citizens of Georgia will be blessed with good country roads, on which travel and transportation will be pleasant at all seasons.

One of the most efficient means of arousing interest on this subject of good roads in Georgia, is the meeting of the county road commissioners held in Atlanta.

RAILROADS OF GEORGIA.

Georgia was from the first introduction of railroads into America, one of the most active in their construction. In fact, her preeminence among her Southern sisters in railroad building, combined with the leading part played by her in the promotion of various manufacturing enterprises, gave her the proud title "Empire State of the South." In the number and extent of her railroads she still ranks foremost. Among and through her mountains and hills, valleys, plains and forests, highlands and lowlands, north, south, east and west, they thread their way, pouring wealth into the laps of Georgia's cities and towns, and giving convenient and rapid transportation to the farmers, merchants and manufacturers of the State. The condition of the roads is excellent. The great trunk lines are laid with heavy steel rails and well ballasted. With

these main lines shorter ones connect many towns and stations, which otherwise would be remote from the great arteries of trade and travel. Several great systems of railroads are operated in Georgia.

The Central of Georgia enjoys the distinction of being the first built in the State (1833). It extended originally from Savannah to Macon. By taking in other lines and building branch roads, it has spread out in every direction, traversing with its 1,301.54 miles of rail fifty-one counties of Georgia, giving to them access to the ocean through the port of Savannah.

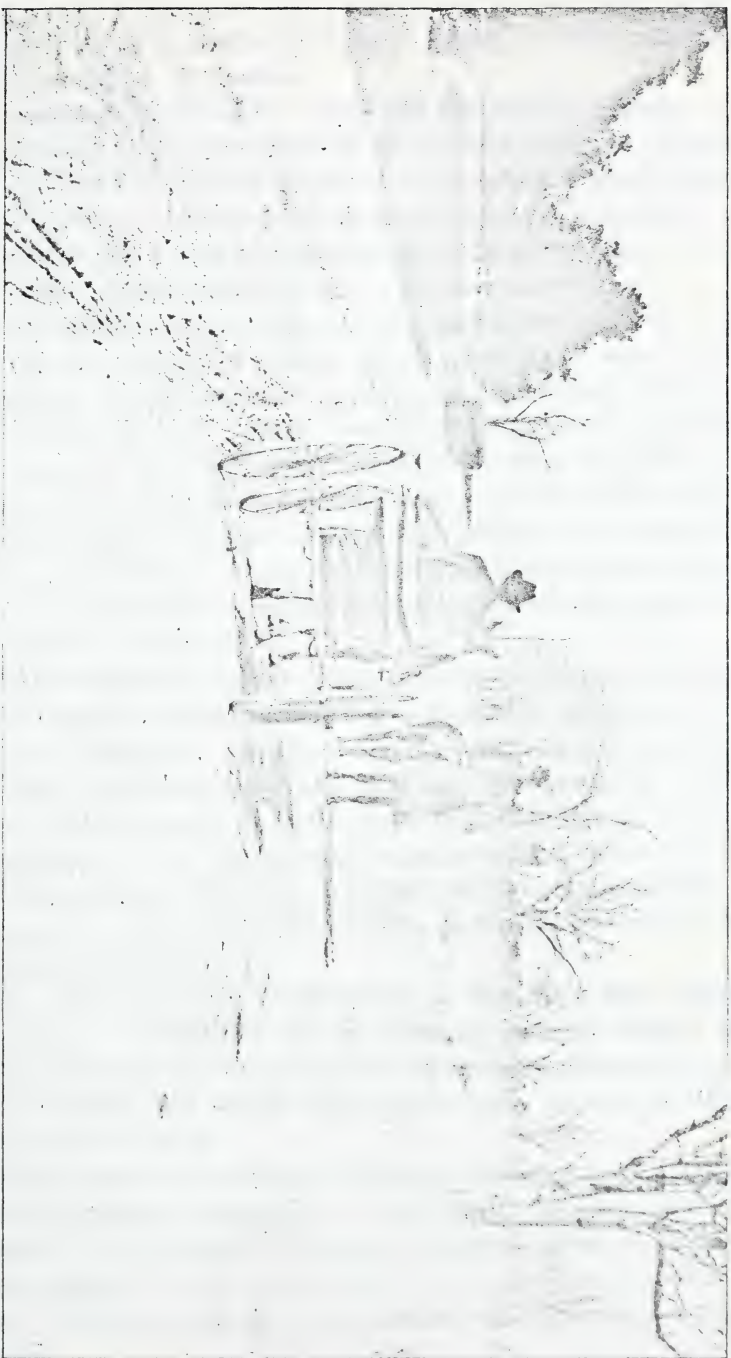
The lines of this company penetrate and cover, in a most complete manner, Middle and Southwest Georgia, the great fruit and trucking sections of the State. Its lines also cross the Chattahoochee river at Columbus, Georgetown and Columbia, and, passing through the mineral, agricultural, timber and naval stores section of Alabama, gather the rich products of that great State and bear the bulk of them to the markets of the world through Savannah, the greatest South Atlantic seaport, where direct steamship connections are made for all points in the East and Europe.

The lines of this great system reach nearly every important town in the State, among which are Atlanta, Savannah, Macon, Augusta, Columbus, Athens, Americus, Albany and Griffin. A great many other progressive towns of Georgia are reached by this system. Twenty-one of these cities and towns have electric light pulants and are otherwise equipped with all modern conveniences.

Among the most important industries located within the territory covered by the Central in Georgia are: fifty-six cotton mills, operating 698,070 spindles and 25,739 looms, representing an aggregate capital of \$10,650,800; one woolen mill; twelve knitting mills; sixteen flour mills; twenty-five cottonseed-oil mills; twenty guano factories; sixty-three brick kilns and clay potteries; twenty-six iron foundries; twenty-seven machine shops; twenty-two canneries; sixteen wagon and buggy factories; five spoke and handle factories; eleven tanneries; twenty-eight ice manufacturing plants; three granite quarries; 131 dairies and 5 creameries.

In addition to the above there were handled from points on the lines of this company during the past year (1900), 126,891 barrels of rosin and 33,158 barrels of spirits of turpentine.

No compendium of facts bearing on the resources of Georgia, or of that territory in the State covered by the Central of Georgia Railway would be complete without reference to the great agricultural and horticultural interests of this section. Of agriculture should be mentioned the more staple crops, cotton, corn, sugar-cane, wheat, rye, oats, potatoes,



WASHINGTON PINE ROAD, RICHMOND COUNTY.

field-peas and broom corn. Under this head we would also mention the making of hay from native and foreign grasses, to which more attention is being paid than ever before.

In horticulture should be mentioned the market gardens, or truck farms, raising cucumbers, beans of all varieties, tomatoes, cabbages, onions, etc. Under this head comes the fruit industry, which has reached vast proportions. More interest than ever before is being taken in growing peaches, pears, plums, apples, grapes of many varieties, watermelons, cantaloupes, cherries, strawberries, blackberries, etc.

In addition to the above mentioned crops, special attention should be called to the growing of tobacco, which has hitherto been a small crop in Georgia. From successful experiments in planting tobacco during the past year in lower Middle Georgia it is confidently predicted that the section of the State lying south of Macon is destined to become in time, one of the greatest tobacco-growing sections of the Union. With the distribution of tobacco seed and the assistance of an expert tobacco grower, all of which is being furnished free to the farmers by the Central of Georgia Railroad, every reasonable effort is being made to interest the farmers in this crop.

The manufacture of syrup from sugar-cane has in the past year or two reached such a stage of perfection, as to render the growing of sugar-cane very profitable. Analyses recently made by thoroughly reliable and expert chemists show that sugar-cane grown on the hill-sides of lower Middle Georgia, or in the light sandy soil on the Atlantic coast, contains from two to four per cent. more saccharine than can be grown in the alluvial lands. The farmers in this territory are appreciating the importance of paying more attention to growing sugar-cane and to the handling of its products.

The timber and lumber industries in this State have reached vast proportions. In addition to the enormous trade in Georgia pine and all hard woods in our domestic markets, there are millions of feet of this class of timber and lumber exported annually through the South Atlantic and Gulf ports.

The terminus of the Central of Georgia Railway, with its magnificent wharf and terminal properties, is at Savannah, the great South Atlantic seaport. In the sketch of Chatham county is given a complete statement in detail of the business handled through this port during the past year. A large percentage of this was handled by the lines of the Central system.

The Southern Railway operates in the State of Georgia nearly 1,016 miles of travel. Beginning at Atlanta lines radiate to the south, west,

north, and northeast, and place the cities and towns of the State along its lines in close touch with the Atlantic Ocean, the coal fields to the west and the great cities and markets of the North. Its lines pass through the important cities of Atlanta, Augusta, Athens, Columbus, Griffin, Macon and Rome, and connect them with Savannah, the greatest South Atlantic port, and with Brunswick, the second in importance of Georgia's ports.

Fifty-one counties are traversed by this system, and, taken as a whole throughout the State, every variety of resource, soil, climate and industry in Georgia is found somewhere contiguous to its lines.

The textile industry is well represented. On January 1, 1900, there were in the towns tributary to the Southern in Georgia, forty-four cotton mills, operating 628,896 spindles and 16,960 looms, and representing a capital stock of over \$10,000,000. There were also six knitting mills and six woolen mills, and there are now under construction, or completed since that date, twenty other textile concerns.

The timber wealth of this country is enormous, and at the present time there are tributary to the Southern seventy-five saw and planing mills with a daily capacity of about 780,000 feet of pine, oak, poplar and other lumber. There are nineteen cottonseed-oil mills with several more under construction or in contemplation. There are also more than forty grist and flour mills, besides new ones now contemplated, to handle the large wheat crop. In fourteen towns there are electric light plants; in five, large brick making establishments, while many more have clay deposits suitable for development; more than forty foundries, machine works, or other iron industries; five canneries, and as many more projected or being built; eight furniture plants and a large number of factories making spokes, handles, wagons, crates, coffins, vehicles, etc. Several towns have ice factories, and at a large number quite a business is done in shipping naval stores to Brunswick and Savannah for export. There are four companies making leather products, two creameries, several fertilizer factories and a large number of gineries. The most active mineral district is Dahlonega, tributary to the Southern at Gainesville, where a large stamp mill and chlorination plant has been erected, extensive mining done and a large amount of money expended in developing the gold deposits of that section. At Gainesville a million dollar cotton-mill is being erected; another small one organized and a smelter projected.

The Southern traverses the great mineral section of the State as well as some of the best lands for all the staple crops, fruits, melons, berries and vegetables, and some of the finest timber lands in the world. The Southern and Central systems give to a large section of the State two

splendid competing lines, and each stretches out its great arms into sections not traversed by the other. Both these roads are doing all they can to advertise and build up the sections through which they pass, and their efforts are meeting with great success.

The Plant System operates in Georgia 616 miles, and traverses nineteen counties, possessing every grade of soil from light sandy and alluvial to the heaviest clay and river bottom, and having a climate temperate and especially adapted to agriculture and horticulture. On its line are three cotton-mills with 18,000 spindles; three cottonseed-oil mills, four fertilizer factories, two barrel factories, ninety-six turpentine stills, twenty-five camps where railroad ties are manufactured and sold. Eight of the towns on the system have electric plants, viz.: Savannah, Brunswick, Quitman, Waycross, Albany, Valdosta, Thomasville and Bainbridge. There are two brick plants at Albany, one at Bainbridge and one each at Johnson's and Williams's stations, five in all; also one pottery plant at Stockton. There are foundry and machine works at Savannah, Brunswick, Waycross, Albany, Valdosta and Tifton, and canneries at Tifton and Albany. There are also bucket factories at Whigham and McRae's. Along the lines of this system the output of naval stores amounts to 260,000 barrels of rosin and 90,000 barrels of spirits of turpentine. There are ice plants at the eight large towns. Almost every mile of the territory traversed by the Plant System is suitable for agricultural and horticultural pursuits, dairying and grape growing. Dairy farming is profitably conducted near most of the large towns.

The Georgia Railroad was the second chartered in the State (Dec. 31, 1833). Its main line connects Augusta and Atlanta, and including its branches operates 314 miles and traverses eighteen counties, having on its line the two important terminal cities already named besides Athens, Macon, Greensboro, Madison, Covington, Oxford, Milledgeville, and other smaller but flourishing towns. The country traversed is a part of the great cotton belt of Georgia. Many of the foundries and mills already spoken of as being on the line of the Central and Southern systems are also on the line of the Georgia Railroad at Atlanta, Augusta, Athens and Macon. There are brick plants at several points, and potteries at Milledgeville, Macon and Grovetown. At each of the terminal points of the main trunk of the Georgia Railroad are extensive planing-mills and furniture factories. No road in the State has more extensive local traffic, in both freight and passengers.

The Georgia Southern and Florida Railway Company operates 169 miles of track in Georgia, beginning at Macon and ending at the Florida State line, connecting Vienna, Cordele, Tifton, Valdosta and many

smaller towns with Macon, its chief terminal. The principal trade opened up by this line is that of lumber and naval stores. There are on its line within the State of Georgia forty-seven sawmills with a daily capacity of 1,073,000 feet of lumber; twenty-one planing-mills with a daily capacity of 454,000 feet; eighteen shingle-mills with a daily capacity of 425,000 shingles; six lath mills, turning out daily 94,000 laths; five stave mills capable of a daily production of 77,000 staves; twenty-five turpentine stills turning out 85,000 barrels of rosin and 25,000 barrels of turpentine annually. Beginning at Macon this line runs along a ridge between the Ocmulgee and Flint rivers, the waters of the former flowing into the Atlantic Ocean, and of the latter into the Gulf of Mexico. This territory is for the most part what is known as the "wire-grass" section, and is one of the best in the State for grain, cotton and stock. The farms are generally small and cultivated by the owners, who, raising their own provisions and making cotton a surplus crop, are generally out of debt and prosperous. Long-staple or "sea-island" cotton is chiefly raised in the Southern counties, there being marketed at Valdosta alone one-tenth of this entire crop in the United States. This is also a great section for fruit, which is less liable than in other sections to frosts in the spring, as was shown in 1894 and 1899, when a considerable quantity was shipped off this line, while in other parts of the State peaches were a total failure. There are on this line outside of Macon two cotton factories aggregating 14,000 spindles and 450 looms, with a capital of \$235,000, three cottonseed-oil mills, three guano factories, two ice factories, three iron foundries, four machine works, three canneries, one spoke and handle factory, one broom factory, four barrel factories, one wagon and one buggy factory, and two harness factories. There are on the line in Georgia five brick yards, four being in Macon and one near Lenox in Berrien county. There is not much dairying along this line, but those engaged in the business are prosperous.

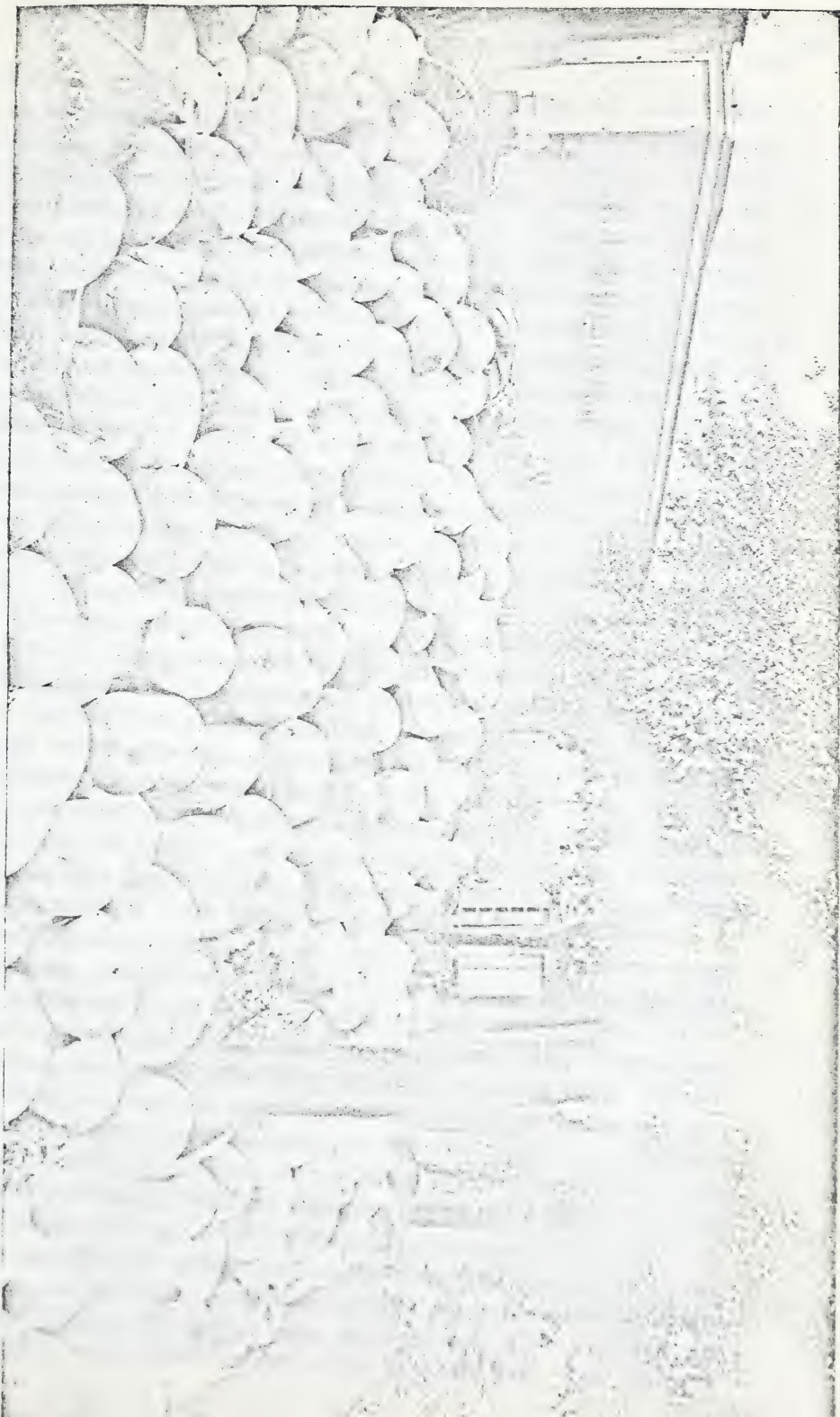
Considerable upland rice is produced for home consumption, and in some years considerable is shipped. The yield is 30 bushels to the acre.

Both cigar and smoking tobacco have been grown along this road, the former producing from 1,000 to 1,200 pounds to the acre, and the latter averaging 750 pounds to the acre. A good local market would cause a renewal of the growth of this plant.

This region is especially adapted to the growth of sugar-cane, which is true also of the sections traversed by the Central, Southern and Plant systems. Many families from the northwestern and other States are settled along the Georgia, Southern and Florida.

The Western and Atlantic division of the Nashville, Chattanooga

SHIPPING MELONS AT DIETZEN'S.



Railway system operates in Georgia 139 miles, of which eighteen are known as the Rome Railway. This road connects Atlanta with Marietta, Acworth, Cartersville, Rome, Calhoun, Dalton and Ringgold in Georgia, and Chattanooga in Tennessee, passing through seven counties, embracing a splendid agricultural section, whose crops of cotton, grain and hay are excelled nowhere in the State. Fruit trees, especially peach, have been planted in great numbers and with wonderful success. From Cartersville to the Chattahoochee river grape culture is successfully carried on, and from Ringgold and vicinity strawberries are grown and shipped in abundance. The section about Ringgold is best adapted to small fruits and grain; about Dalton to vegetables, fruits and grain; about Calhoun to corn, small grain and peaches; about Adairsville to wheat and peaches; about Cartersville to fine staple cotton, corn and wheat; around Marietta to cotton, peaches and grapes; around Smyrna to small fruits, peaches, grapes and cotton. Considerable sorghum is made for domestic use. Tobacco is grown in small quantities for home use only. A fine timber country is tributary to the line on the headwaters of the Coosawattee and Conesauga rivers, which streams unite above Resaca to form the Oostanaula. All manufacturing interests seem to be in a thriving condition. The increase in mining has probably been 100 per cent., in other lines about 20 per cent. Outside of Atlanta, are the following cotton mills: two at Dalton with a total of 25,000 spindles and 620 looms; one at Rome with 5,200 spindles and 108 looms. There are nine flour mills; cottonseed-oil mills at Rome and Acworth; knitting mills at Marietta and Atlanta; paper mill at Marietta, and mills for production of guano filler (graphitic slate) at Emerson. There is a carriage factory at Cartersville, a crate factory in Adairsville, furniture factories at Rome, Dalton, Acworth, Marietta and Atlanta. There are tanneries in Atlanta, Acworth and Cassville, and ice plants in Atlanta, Marietta, Cartersville and Rome. There are iron ore beds near Emerson, Cartersville, Roger's Station, Clifford, Adairsville, Tunnel Hill, Ringgold and Allatoona, near which latter place is a gold stamping mill. There is manganese in abundance near Cartersville; granite at Vining's Station and on Kennesaw Mountain, but no quarries; black and variegated marble near Calhoun and Dalton, but not being quarried; large marble mills in Marietta, using marble from along the line of the Atlanta, Knoxville and Northern Railroad, on which connecting line are a number of quarries in operation, the greater portion of whose output is handled by the Western and Atlantic. Limestone quarries are in operation at Graysville and Clifford, the output being eight car-loads a day. At Cement are cement works whose output is 200 barrels a day. The Southern

Company plaster works at Emerson, making filler for fertilizers, have an output of 10,000 tons per annum.

The Atlanta, Knoxville and Northern, operating 105 miles in Georgia, runs from Marietta to the Tennessee line, through six counties, passing through the town of Canton, Tate, Jasper and Ellijay. Through the Western and Atlantic Railroad it connects with Atlanta. Along this line are some large orchards and the finest marble quarries of Georgia.

The Macon and Birmingham Railway operates nearly ninety-seven miles of its own track and uses about eight miles of the track of the Central between Macon and LaGrange, having on its line also the towns of Culloden, Yatesville, Thomaston and Woodbury. It traverses six counties of an excellent agricultural district, the principal product of which is cotton. There is one cotton mill of 6,600 spindles at Thomaston; two at LaGrange aggregating 27,500 spindles, and a third one of 10,000 spindles in process of erection. There are electric light plants at Thomaston and LaGrange, a cottonseed-oil and guano factory at LaGrange, and a shoe factory at Thomaston. There is a factory for the manufacture of sash, doors, blinds and crates at Woodbury, and a coffin factory at Mutual, operated by the Mutual Aid Society (colored). The output of naval stores is 5,000 barrels of rosin and 100 barrels of spirits of turpentine. There is a tannery at Thomaston and a creamery at LaGrange. There are excellent granite deposits for thirty or forty miles of the distance, principally in Upson and Meriwether counties. There is a granite quarry at Odessadale. Along the line the agricultural products are cotton, corn, sugar-cane, sorghum, wheat, oats, rye and potatoes. The land is well adapted to grapes, peaches and other fruits, the flavor of which is especially good, owing to the large amount of potash in the soil.

The Seaboard Air Line operates nearly 134 miles of railroad between Atlanta and the South Carolina State line, traversing eight counties, and passing through the towns of Lawrenceville, Athens and Elberton. The country traversed is a fine agricultural section and has great manufacturing interests at Atlanta, Athens and Elberton.

The Georgia and Alabama road, running almost a bee line from the Alabama line eastward to Savannah with its many branch roads, 376 miles in all, and traversing sixteen counties, is now a part of the Seaboard Air Line system. It transports the products of a large section of Georgia and Alabama to swell the exports of Savannah. Some of its territory is also traversed by roads of the Central of Georgia and Southern systems. The leading cities and towns on this road and its branches are Columbus, Lumpkin, Preston, Americus, Dawson, Albany, Fitz-

gerald, Abbeville, Mount Vernon and Savannah. All along its line are important manufactories, whose products help to swell its freights. A great many people from northern and western States are settling along the three great lines of the Seaboard Air Line. This is true also of the Central and Southern.

The Florida Central and Peninsular Railroad, which, with its hundred and thirty-eight miles, traverses eight counties of Georgia from the Florida line to Savannah, thence northward to the South Carolina line in Effingham county, has also been consolidated with the Seaboard Air Line system. Along its line are large sawmills and turpentine distilleries. Its main shipments are naval stores gathered at the stations along its route through the great pine belt of Georgia. It passes near St. Mary's, but not through any important town in Georgia except the city of Savannah, which it connects with Fernandina, Jacksonville, Lake City, Live Oak, Madison, Tallahassee, St. Marks and other points in Florida. The total number of miles embraced in this great combination, now known as the Seaboard Air Line system, is 648, passing through thirty-two counties of Georgia.

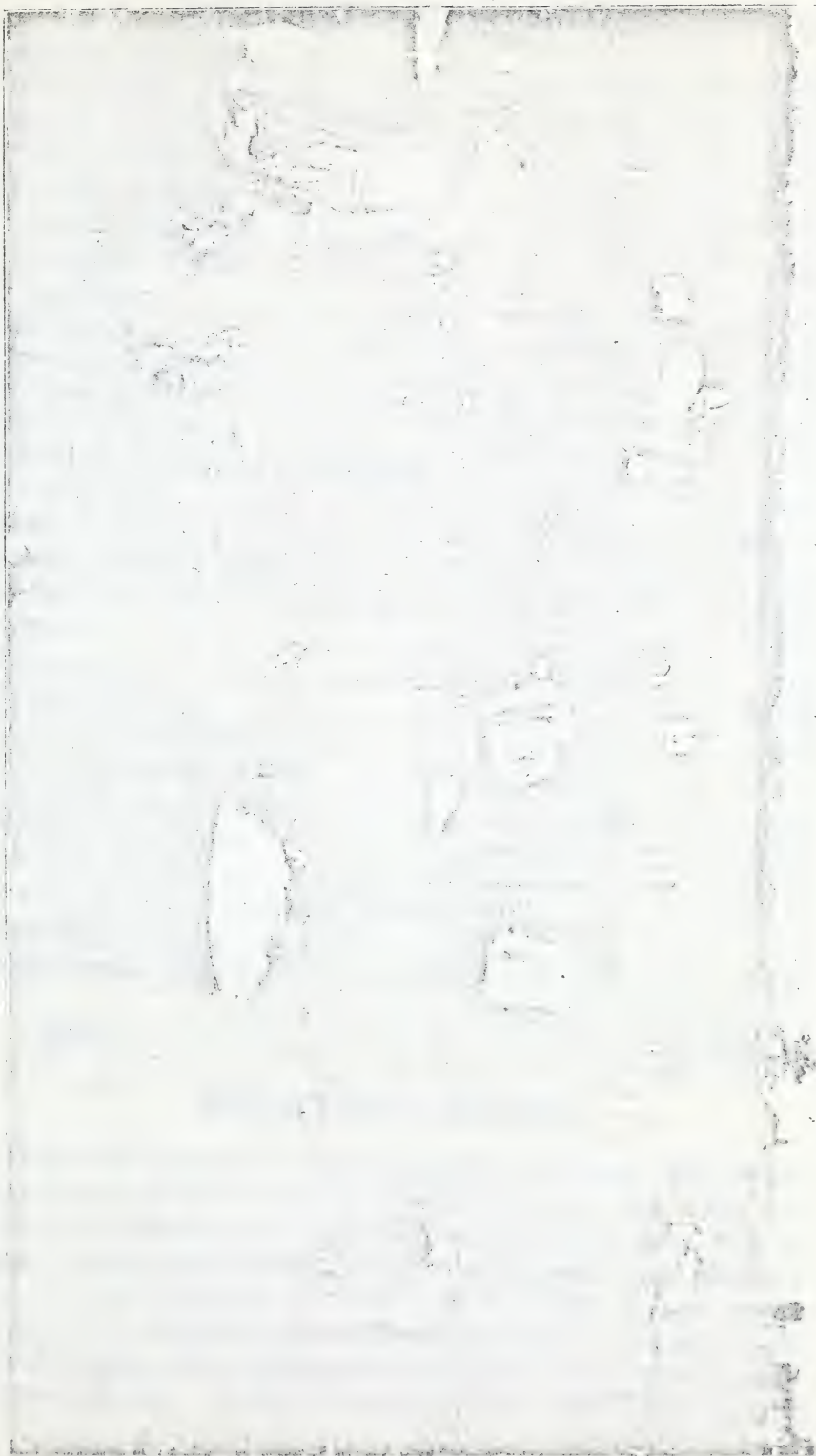
The Atlanta and West Point Railroad, named for its two terminal points, passes through five counties of a productive portion of Georgia. The soils along this line are red clay, sandy, with clay subsoil and hummock lands. Abundant crops of the staple productions of Georgia are handled by this road. It forms a connecting link between the great trunk line systems from the East and the Louisville and Nashville Railroad, and thus participates in the carrying of the trade from the eastern markets to the Pacific coast, and likewise shares the freight moving in the reverse direction. The industries along its line are varied, consisting of agriculture, dairying, fruit-growing, cotton factories, foundries, canning establishments and tanneries. There is one flour mill at Newnan, one knitting mill at Grantville; of cotton-oil mills, one each at Newnan, LaGrange, Hogansville and West Point; of brick plants, one each at Moreland, West Point, Speers and Hogansville. Iron foundries and machine shops are located at Newnan, Moreland and West Point; there are two canning establishments, one at Newnan and one ice plant at Newnan. Three towns, Newnan, LeGrange and West Point, have electric plants. There is a gold mine in operation near Grantville. There are along this line seven cotton mills with 144,000 spindles, representing a capital of \$3,032,000.

The lands are adapted to general farming, fruit and vegetables. Large quantities of grapes and peaches are raised near Moreland, Coweta and Newnan.

The above are the principal railroad systems of Georgia. There are many short lines which play an important part in giving an outlet to the products of many sections, which without them could not reach the trunk lines except by the tedious and more expensive method of transportation offered by the mule team upon the country road. The following table, prepared for the last annual report of the Railroad Commission of Georgia, gives the railroad mileage of the State together with the names of the respective lines:

RAILROAD MILEAGE IN THE STATE OF GEORGIA FOR
1901.

Alabama Great Southern	24.32
Albany & Northern	35.00
Atlanta & West Point	86.11
Atlanta Belt Line	5.50
Atlanta, Knoxville & Northern	105.30
Atlantic, Valdosta & Western	70.13
Augusta Belt	3.80
Augusta & Summerville	2.00
Augusta Terminal	1.44
Central of Georgia	1,301.54
Charleston & Western Carolina	20.47
Chattanooga Southern	42.65
City & Suburban	22.00
Collins & Reidsville	6.91
Darien & Western	29.00
Dooly Southern	8.00
East & West	45.70
Flovilla & Indian Springs	3.00
Foy Railroad	10.00
Gainesville, Jefferson & Southern	65.00
Georgia	314.50
Georgia Northern	51.00
Georgia Pine	39.52
Georgia Southern & Florida	169.00
Hartwell	10.10
Hawkinsville & Florida Southern	33.00
Lawrenceville	10.00
Lexington Terminal	4.00
Louisville & Wadley	10.00



PICKING COTTON.

Macon & Birmingham	96.80
Macon, Dublin & Savannah	53.54
Midville, Swainsboro & Red Bluff	17.75
Millen & Southwestern	33.78
Nashville & Sparks	11.50
Nashville, Chattanooga & St. Louis	2.73
Offerman & Western	35.00
Plant System	616.39
Sandersville	4.00
Savannah & Statesboro	34.00
Seaboard Air Line	647.83
Smithonia & Dunlap	7.00
Smithonia, Danielsville & Carnesville	6.00
South Georgia	28.00
Southern Railway	998.15
Sparks, Moultrie & Gulf	40.00
Stillmore Air Line	34.05
Sylvania	15.00
Talbotton	7.00
Tallulah Falls	20.90
Tifton & Northeastern	25.00
Tifton, Thomasville & Gulf	55.50
Valdosta Southern	14.50
Wadley & Mt. Vernon	30.00
Waycross Air Line	45.00
Western & Atlantic (including Rome Railroad)	139.34
Western of Alabama .....	.17
Wrightsville & Tennille	76.00
Total	5,623.92

WATER TRANSPORTATION.

Before the invention of railroads interior towns remote from navigable streams had small chance of becoming centers of trade. The construction of railroads has altered this, and has built up great cities remote from any water highway. And yet a navigable stream gives to a city the great advantage of a competing line, which reduces freight charges to a considerable extent. The Savannah river is navigable to the city of Augusta, whose importance as an interior cotton mart is greatly enhanced thereby. A line of steamboats plies between that city and

Savannah. The Chattahoochee is navigable from the city of Columbus to the Apalachicola and through that river to the Gulf of Mexico. The river trade of Columbus through its several steamboat lines is considerable. The city of Rome enjoys a fine river trade through two navigable streams, the Coosa and Oostanaula. Steamboats bring to that city the productions of the Coosa valley, lumber, iron, grain and cotton, and the staple products of the Oostanaula valley, among them large quantities of walnut, poplar and oak lumber. The Flint, which unites with the Chattahoochee to form the Apalachicola, flows past the flourishing little city of Albany, which enjoys the advantage of an extensive steamboat traffic. Darien has always had a considerable river trade along the Altamaha and its tributaries, the Ocmulgee and Oconee, boats running as far as Hawkinsville on the first named tributary and Dublin on the latter. The Savannah is the most important of Georgia's navigable streams, because over eighteen miles of its course heavily laden ships bear to the ocean the rich and varied articles of export that find their outlet through the prosperous city of Savannah. The St. Mary's will some day play an important part in the development of the southeast section of the State. On its right bank is situated the beautiful little town of St. Mary's, which already, through its fine harbor, accessible to the largest vessels, has a considerable trade in lumber, a large amount of which is brought to this port by the boats that ascend the river for some miles. The Satilla and Ogeechee are other navigable strams of Georgia, whose advantages have not been utilized to any considerable extent. Other navigable waters of Georgia are the inlets and sounds which flow between the mainland and the charming islands that skirt the coast from the Savannah to the St. Mary's. Through St. Simon's sound the largest vessels pass up the Turtle river to Brunswick, the second in importance of the seaports of Georgia, a city with a bright future before it, like Savannah, the center of a fine fruit and truck farming section, and having excellent shipping facilities.

CHAPTER VI.

AGRICULTURE.

Having discussed the economic minerals, water-powers, soils, and means of travel and transportation of our State, both by land and water, it is well to take up here the subject of agriculture, the special care of the department under whose auspices this work is given to the public, and to which already abundant reference has been made. What has been done in this important field of enterprise in Georgia is a matter of history. What shall be done in the future will depend upon the skill, as well as the industry, of our farmers.

Cotton.—Cotton, when made a surplus crop, and cultivated with such limitations as a sound business judgment would dictate, is still the great money crop of Georgia. Although our State has for several years past ranked most of the time as the second in cotton production, its average yield to the acre is not so great as one might suppose, who has seen the wonderful results secured on some farms by the employment of the best scientific methods. The reason for this is, that the loose methods which prevailed in the ante-bellum days, when, after exhausting the land, the planter sought new fields, are still employed on many farms. These are rented out for fixed money value or for share of products to unskilled negro laborers, who, without the guiding hand of an intelligent white farmer, cannot be expected to produce the best results. What Georgia soil can be made to do under the best scientific farming was shown in a previous chapter (page 155.) The more numerous the class of skilled farmers, the better show will Georgia make in her average yield by the acre.

From the first Georgia has stood high in production among the cotton States of the Union. For many years it was outranked only by South Carolina, which State was the first to engage in this industry. After passing South Carolina, Georgia was second only to Mississippi. In 1849 it fell behind Alabama; but in 1880 again took rank just behind Mississippi. Since 1895 it has, with the exception of one year, gone ahead of everything except the combined yields of Texas and Indian Territory. In this connection the following table will be found interesting:

COTTON CROP BY STATES—BALES.

	1900-01	1899-1900	1898-1899	1897-1898	1896-1897	1895-1896
Alabama	1,000,000	1,003,313	1,159,000	1,159,000	1,019,000	830,000
Arkansas	762,000	669,385	834,000	922,000	700,000	620,000
Florida	45,000	41,855	70,000	70,000	60,000	48,000
Georgia	1,295,000	1,345,699	1,536,000	1,536,000	1,300,000	1,079,000
Louisiana	719,000	699,476	590,000	740,000	575,000	430,000
Mississippi	950,000	1,203,739	1,522,000	1,627,000	1,226,000	860,000
North Carolina	542,000	503,825	583,000	583,000	500,000	384,000
South Carolina	911,000	830,714	1,012,000	1,003,000	800,000	664,000
Tennessee	350,000	355,000	414,000	485,000	330,000	252,000
Texas (and Indian Territory to 1899)	3,809,000	2,433,555	3,555,000	3,075,000	2,248,000	1,990,000

For the season of 1899-1900 Texas is estimated by itself.

The total cotton acreage of Georgia for the crop of 1899-1900 was 3,287,741.

Of Georgia's cotton production for the season of 1899-1900 the up-land crop was 1,284,811 bales, averaging 490 pounds to the bale, at 7.11 cents a pound, and thus bringing \$44,761,530. The sea-island crop was 60,888 bales, averaging 397 pounds to the bale, at 13.5 cents a pound, making this crop worth \$3,263,292. The entire crop of Georgia was 1,345,699 and was worth \$48,024,822. The average to the acre for the whole State was about 600 pounds of seed cotton.*

*The total Sea-island crop of 1899-1900 is shown in the following table taken from the report of the U. S. Department of Agriculture:

Sea-Island Cotton Crop for 1899-1900

State	Receipts at—				Total Crop
	Savannah.	Charleston	Brunswick	Jacksonville	
Georgia	<i>Bales.</i> 49,939	<i>Bales.</i>	<i>Bales.</i> 10,949	<i>Bales.</i>	<i>Bales.</i> 60,888
Florida	22,278	.....	.....	7,329	29,607
South Carolina	33	7,810	.....	.....	7,843
Total	72,250	7,810	10,949	7,329	98,338

The Department's special agent at Charleston, S. C., Mr. Lewis F. Sloan, submits the following statistics and observations relating to this crop:

Exports and Coastwise Shipments

Ports	Exports in Bales to—			
	Great Britain.	Continent.	American Mills.	Total.
From Charleston	4,991	1,368	1,516	7,875
From Savannah	33,181	6,639	30,806	70,626
From Brunswick .....	.....	.....	10,745	10,745
From Jacksonville .....	.....	.....	7,329	7,329
Total	38,172	8,007	50,400	96,579

Stock on hand at Charleston, S. C., September 1, 1900.....bags... 385
 Stock on hand at Savannah, Ga., September 1, 1900.....do... 1,688

Total stocksdo... 2,073



A CORN FIELD.

The following States, including Oklahoma Territory, not in the above list also raised some cotton: Virginia, 8,007 bales; Missouri, 17,275; Oklahoma, 66,555; Kansas, 188; Kentucky, 24; Utah, 26.

A cotton crop does not necessarily deplete the soil more than other crops. But the fields, being left bare, are washed and leached by winter rains, and some of the best elements of the soil are withdrawn. A systematic rotation of crops would save this waste and preserve the fertility of the land. A judicious use of fertilizers will enormously increase the productiveness of the fields and correspondingly enlarge the profits of the planter. The composting of commercial fertilizers with animal manures, marl, muck and cottonseed will greatly reduce the cost of fertilization. All the manurial resources of the farm should be saved under shelter that they may be ready for application to the fields at the proper time. For every pound of lint produced there are two of seed, which are useful as a fertilizer. Peavine hay, properly turned under, has already been frequently mentioned as a cheap and valuable fertilizer. No longer is the sale of the lint the only source of profit derived from the cotton crop. The various uses made of the seed, for food for stock, for oil and a fertilizer, swell the profits of the skillful and provident farmer. The steady increase throughout Georgia of mills, either for the manufacture of cloths and thread from the lint, or of oil, cotton-meal cakes and hulls from the seed, has already affected the price of cotton to the great advantage of the producer. Let every farmer raise his own supplies, and plant the rest of his land in cotton. Then competence and wealth will reward his skill and diligence.

Some idea of the increased wealth to the farmers of Georgia, derived from the by-product of the cotton, may be gathered from the following statement: In 1890 the cottonseed of Georgia amounted to 596,000 tons, the average value of which by the ton, was \$10.21, which would give \$6,085,160. During the season of 1898-99 the number of tons of cottonseed was 778,000. Toward the close of the season this sold as high as \$14.00 a ton. At that rate the value of the total product amounted to \$10,892,000. Of course it was not all sold, some of it being used as a fertilizer, and some as feed for stock. Yet the possibilities, as shown by these figures, enable one to form some idea of the value to the farmer of his cottonseed, which in ante-bellum days were considered of no account. There is no doubt that cotton properly managed is the greatest wealth-producing crop in the United States.

Any skilled farmer of the West and North, who, in the great grain States, makes a success of farming, will find his opportunities for acquir-

ing wealth in his chosen occupation greatly enlarged by settling in Georgia and adding to his assets the rich revenue, that comes from an intelligent cultivation of the fleecy king.

EGYPTIAN COTTON.

The experimnets in the Southern States on Egyptian Cotton have been very limited. The United States Department has several times in the last decade sent out a few of these Egyptian seed for experiments, but, although the results have not been very satisfactory, the Department is convinced that the Egyptian cotton can be grown in favorable localities in the South, especially in parts of South Carolina and Georgia. It has been suggested that the Egyptian cotton should supply the mills from our Southern cotton fields, and the idea is a good one.

The Jannovitch Egyptian cotton was grown in South Carolina under the direction of the Division of Vegetable Physiology and Pathology. In common with other Egyptian varieties it shows a marked resistance to root disease. It has many good qualities, chief among which are the length and quality of the staple and fiber of the plants. It has disappointed the planters, however, by its small bolls, making the cotton hard to pick, besides the yield is not so large as that of upland cotton. It is easier to pick than the Sea-Island cotton, and makes about as much to the acre. This Egyptian cotton is inclined to run to weed on rich, moist soils, whereas it does not grow large enough in the poor soils in the hilly counties. Hence, the Egyptian cotton grows best in those parts of Georgia, Florida, Alabama, and South Carolina, where the Sea-Island cotton is more or less established, not only because these soils will probably prove to be best adapted to the Egyptian cotton, but because the planters are accustomed to the planting and handling of long-staple cotton, and have the roller gins necessary. "The importation of cotton from Egypt steadily increased," say the Department at Washington, "from less than two hundred thousand pounds in 1884 to more than forty-three million pounds in 1896." The price of Egyptian cotton ranges from four to six cents higher than the price of ordinary American upland cotton. The annual import of cotton from Egypt for the last three years has averaged in value nearly four millions of dollars. The Egyptian cotton has a very fine, silky fiber, generally shorter than that of Sea-Island, but longer than that of upland varieties. It is used in the manufacture of fine yarns for the finer qualities of hosiery and knit goods. A number of mills buy this Egyptian cotton to mix with wool, since it is much

harder to detect in wool than our American upland cotton. As has been said before, some attempts have been made to grow Egyptian cotton in this country. In 1894 the Department imported and distributed a stock of Egyptian seeds, and, while experiments with these have shown favorable results, there is still need of further trial to determine the exact conditions, under which this cotton can be grown to best advantage. The Agricultural Department at Washington is of the opinion that with proper management the Egyptian cotton industry may become well established in the United States.

In 1897 the United States imported of Egyptian cotton nearly six thousand bales; in 1899 it had increased to more than sixty thousand bales. One great cause of this importation is, that the Egyptians handle their cotton with so much more care than the South does. Our country now supplies about eighty per cent. of the cotton consumed by the mills of Europe and America.

Egyptian cotton has a long, strong, silky staple from $1\frac{1}{8}$ to $1\frac{5}{8}$ inches in length, while the staple of what is called our upland cotton ranges from $\frac{3}{4}$ to 1 inch, and of our Sea-Island cotton from $1\frac{1}{2}$ to $2\frac{1}{2}$ inches. It is especially adapted for sewing thread, fine underwear, and hosiery, such as balbriggan, and for other goods requiring a smooth finish or a high lustre. It gives a fabric a soft, silky-like finish, and this character, together with its lustre, makes it desirable for mixing with silk in the manufacture of various kinds of silk goods. Hence this Egyptian cotton does not compete with either our short-staple or long-staple. It fills a gap between the two.

Another reason for the increase of the Egyptian cotton importation is, that many descriptions of goods are now made in this country which were formerly made in Europe.

Now we come to the question, can Georgia and the South raise these 60,000 bales of Egyptian cotton which our mills annually use? The State Department of Agriculture is clearly of the opinion that this can be done. Wherever long-staple cotton can be grown successfully the Egyptian cotton can be grown. While we would not advise one to plant his entire crop with the Egyptian variety, still we think it worthy of a fair trial.

Corn.—Next to cotton in rank as a staple crop of Georgia comes corn. The yield of this important cereal, wherever the best methods are employed, is very large. As is the case with cotton, so also, in respect to corn, the number of farms in every county tilled by unskilled methods brings down Georgia's average yield to the acre. This is between eleven

and twelve bushels, although it has been seen that some of our most progressive farmers have produced as much as 125 bushels to the acre. Of the cotton States, however, only two, Tennessee and Teaxs outrank Georgia in the area devoted to corn. Counting in the great grain States of the northwest, which produce no cotton, Georgia, in 1890, came in as the eleventh State in the number of acres devoted to corn, viz.: 2,592,316, which yielded 29,261,422 bushels.

By the census of 1900 Georgia's corn area was 3,411,953 acres and her production, 34,119,530 bushels, valued at \$19,448,132. On March 1, 1901 the stock on hand was 17,400,960 bushes, or 51 per cent. of the crop. The number of bushels shipped out of the counties in which they were grown was 2,047,172.

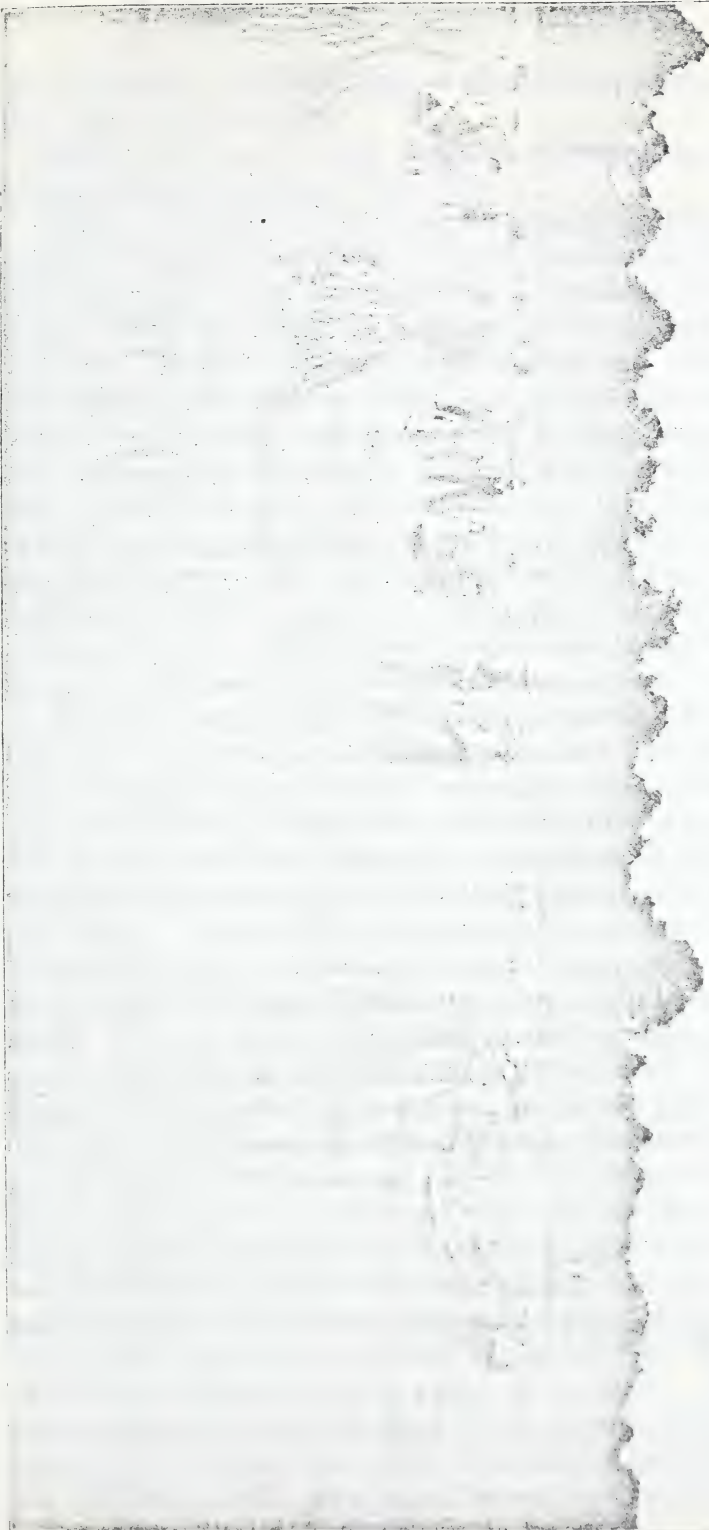
In the years of the civil war Georgia's production of corn was very great, and the southwestern part of the State was the granary of the Confederacy.

Corn is one of the most important products of the field, and every farmer should seek to increase the capacity of his land to give him an abundant yield. From the matured grain comes the meal, which constitutes the chief source of the bread supply of thousands of people, while the bran separated from the meal by bolting, forms an excellent feed for stock. For this latter purpose the unground grain is also used, the ration of corn upon the cobb being part of the daily stock food in every well-filled stall. The truck farms, or market gardens, which furnish vegetables to neighboring or distant cities and towns, send to the market thousands of juicy roasting ears, a favorite article of food in every American community.

But when we have considered the acreage and production of corn, we have by no means exhausted the subject. The leaves, or fodder, and the shucks that are stripped from the ears constitute, when properly cured, a forage highly prized on every farm. Sometimes while in a green state, the stalk, fodder and shucks are cut up together, and being deposited in a silo, constitute the corn ensilage, so useful as a food for the milch-cow and other stock.

The old-time custom of pulling fodder is not so much in vogue now as formerly. At the proper time, before the grain is fully ripe, the stalks, with their leaves and corn still on them, are cut and shocked like wheat or other grain. Then, when the ears have been taken out of the shucks, the shucks are shredded by means of a machine made for that purpose, and the material then baled is ready for the market. Sometimes a field of corn is purposely planted so closely as not to produce ears, and

HARVESTING WHEAT.



the whole mass, at the proper stage of advancement, being cut down, affords most excellent forage.

Further mention of the uses of corn as a forage crop will be made in the section on grasses and forage crops.

Wheat.—Although Georgia, being a leading cotton State, has never ranked in wheat production with the North Central grain States, yet her soil, when sowed in that important cereal, is capable of producing great results. Before the days of low freight rates from the great west, wheat cultivation was very remunerative in Georgia, and Georgia flouring mills declared large dividends. But the grand trunk lines, with their low rates of transportation, made it so difficult for Georgia millers to compete with the west, that many of the leading mills abandoned the contest. Then the farmers sowed but little more than enough for their own use, and Georgia's acreage and production rapidly declined. At the time of the census of 1890 her wheat area was 196,633 acres, with a production of 1,096,312 bushels, or a little more than five and one-half bushels to the acre. But the fact that they were raising cotton to such an extent as to cause an over-production and consequent low prices, aided by the constant and persistent efforts of the Department of Agriculture to induce the farmers to pay more attention to wheat, oats, and other small grains, brought about a wonderful revival of wheat culture. Articles urging the planting of more wheat which from time to time went forth from the department, were copied in many agricultural publications and reprinted in agricultural monthlies having extensive circulation among the farmers. The result was the selection of some of the best lands for wheat, and a great increase in the acreage from year to year. As the farmers increased their production, the Georgia mills once more became active. Old ones that had shut down started up again, and new ones were built in different parts of the State. The revival of the wheat industry has been especially noteworthy in the last two years. The fall of 1899 saw a larger percentage of land in wheat than ever before. Georgia, not satisfied with her record as one of the foremost cotton States, seems to be progressing to the point where she can take a proud stand among the wheat growing States of the South. Her wheat area in 1899 was 297,239 acres and her production, 2,021,225 bushels, showing an increase in area of 101,606 acres, and in production of 924,913 bushels. The value of the wheat crop of 1899 was \$1,980,800. The wheat crop of 1900 was 5,011,133 bushels, valued at \$4,760,576. This crop was grown on 550,674 acres, and 501,113 bushels were shipped out of the counties in which they were grown. The stock on hand March 1, 1901, was 1,302,895 bushels. The splendid increase in acreage and production

of wheat for 1900 is highly gratifying to those who are anxious to see Georgia take her proper stand as a wheat-growing State.

Some farmers sow wheat as a forage crop, preferring it to oats, rye or barley for that purpose. What may be done with wheat in Georgia is best seen, not from the general average, reduced by causes previously mentioned, but from what has been accomplished on some of the best managed farms. The following yields of wheat are well authenticated: from one farm in DeKalb county, sixty-five bushels to the acre; from one in Carroll, forty bushels; twenty-eight bushels an acre from farms located in Cherokee, Milton and Walton counties. Of these five counties Dekalb, Carroll and Walton are on the northern border of the Middle Georgia belt; Cherokee and Milton are higher north. In Oconee, a Middle Georgia county, forty-eight and one-half bushels of wheat were grown on one acre in 1900.

On the 11th of July, 1900, the third annual convention of the Wheat Growers Association of Georgia was held at the Academy of Music in Macon. Reports were made and prizes which had been offered by the *Telegraph*, the leading journal of Macon, were bestowed for the best yields of wheat. In each case the report was rendered by different committees, each consisting of three gentlemen, who measured the field reported and the wheat as it was threshed, and supported their report by sworn affidavits. The yields were as follows: from four acres in Spalding county belonging to W. J. Bridges, an average of sixty-five bushels to the acre; from four acres in Spalding county, belonging to W. D. Walker, an average of fifty-nine and one-half bushels to the acre; from four acres in Bibb county, belonging to Julian R. Lane, an average of forty-one and one-fourth bushels to the acre; from four acres in Washington county, owned by T. H. Cox, an average of twenty-eight bushels to the acre; from four acres in Jones county, owned by W. F. White, an average of twenty-four bushels to the acre; from four acres in Wilkinson county, owned by Z. T. Miller, an average of nineteen and three-fourths bushels to the acre; from one acre in Bibb county, owned by J. S. McGee, thirty-nine and three-sevenths bushels. The average of all these reports from five counties of Middle and Southern Georgia is something over thirty-nine and one-half bushels to the acre.

This is another proof of what Georgia can do, and another strong argument in behalf of wheat culture in this State.

Mr. Bridges, the successful competitor in the wheat contest, in an interview with a reporter of the Macon *Telegraph*, said: "It has been said by some that wheat should not be planted in the same place two consecutive years, or that it could not be made to yield satisfactorily if it was

done. This, I find, is a mistake, as a portion of my land this year had been planted in wheat for three consecutive years, and on sixteen acres I harvested 711 bushels, or an average of about forty-four and one-half bushels to the acre. This was done on upland too, as I do not approve of bottom land for wheat. . . . About four years ago I began to manure my land with the idea of bringing it up to where the benefit to it would be permanent, and by judicious use of stable manure and droppings from cattle, used with fertilizers, I brought it up to where it would make from one and a half to two bales of cotton to the acre. To do this I gave it a very heavy coating of manure in the spring, and saw that it was well broken up with a two-horse plow. This should be done in the spring always. As to the land that I planted in wheat this year, I gave it a very heavy coat of manure in the spring and then planted it in cotton. After I had gathered the crop, I ripped out the stalks and then turned the land over with a two-horse plow, following that with a cutaway harrow, then rolling it with a heavy roller. My wheat was then put in with a drill, using about four hundred pounds of a special high-grade potash fertilizer at the same time. In planting the wheat, I put in 105 pounds, or one bushel and three pecks to the acre. . . . The land upon which my crop was made is a gray, loamy top soil, with an undersoil of stiff red clay that retains the moisture to feed the roots. I consider that this is the best soil to be found for wheat, as it enables it to withstand a drouth better, or to go through a rainy season better, than a shallow gray soil or an all clay one. The variety of wheat that I sow is the purple, or, as it is sometimes called, the bluestem variety, which has proved the best that I have known used. It should be soaked in bluestone to prevent smut, which is more to be dreaded than rust. To do this successfully you should use about one pound of bluestone in enough water to wet the wheat thoroughly and go right on sowing it. The bluestone should be dissolved in boiling water. It takes only about a gallon of water to every two bushels of wheat. I have always followed this plan and have never had the smut to appear in my wheat. Wheat should never be sown until after the first big frost in November, for then it will withstand more successfully the ravages of the fly, or small grub, that begins at the root and saps the vigor from the young shoots, causing them to grow up spindling, stalks that are short, with faulty heads. The frost seems to have the effect of killing this fly if the wheat has not been planted before and has come up to where it makes a nest for the fly and its young. As for the other bane of the wheat growers, the cheat, I have never had any trouble with that, and am not prepared to suggest any method to get rid of it, though I think that if it were to make its ap-

pearance in my grain that I would take the pains to pull it out, each stalk separately, if necessary.

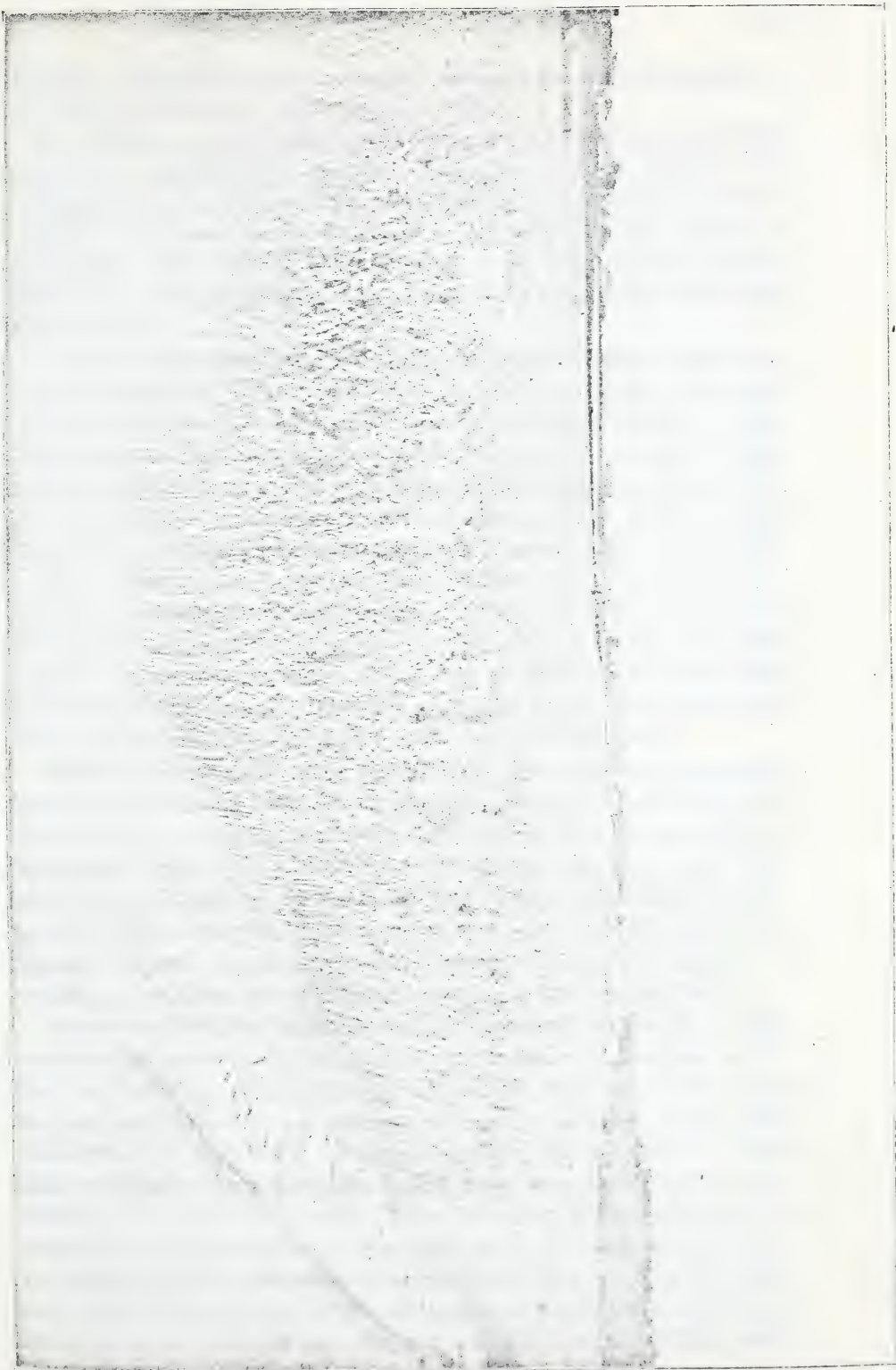
"After harvesting my wheat I then begin and plant the entire acreage in peas, which really amounts to the same thing as beginning to get your ground in condition for wheat again, as there is no known crop, not even clover, that under the same conditions will do your ground the permanent good that peas will. From my peas I usually get from two to three tons of pea hay per acre, and sometimes I expect the yield will reach four tons. This year I have planted about 100 acres in peas and am confident that with continued seasons a large portion of it will yield fully three tons per acre. It cannot be beat as a forage for both horses and cows, and is one of the easiest raised. The acreage that I raised my sixty-five bushels per acre on will again be planted in wheat this fall and has on it as fine a crop of peas as ever grew out of ground. I am more than delighted with my success with wheat this year."

Mr. Thomas H. Cox, whose four acres averaged twenty-eight bushels to the acre, in a letter to the Agricultural Department said: "The land on which my wheat grew was a light gray. I sowed two bushels of the bluestem variety per acre broadcast and plowed it as deep as I could with single plows. I used as a fertilizer about seventy-five bushels of cottonseed. I sowed this crop the middle of November, and gathered the 20th of May. I really believe that if I had prepared my land and had harrowed my grain in, I would have made more per acre by plowing in deep. My wheat never came up regular. I notice that some was coming up fully six weeks after the first had come up. My land was elevated but well terraced."

Mr. W. F. White, who made an average of twenty-four bushels to the acre, wrote to the department as follows: "I broke my land with a one-horse Haimon stock, using a common 4-inch turnplow on what is known as red land, clay subsoil; used twenty-five bushels of cottonseed per acre, sowed one bushel of wheat per acre 15th of November, reaped on the 18th of May. I sowed purple straw, known as bluestem, broadcast; plowed wheat in with 4-inch turner; ran over land with Thomas's smoothing harrow. I soaked the wheat twenty-four hours in a solution of one and one-half pounds of bluestone to five bushels of wheat, keeping it well covered under water for time mentioned; I then rolled it in slacked lime. You can then see where every grain falls."

Oats.—One of the most valuable of our crops is oats. To the raising of this important product our farmers are paying more attention than ever before. Under favorable conditions the yield is good and with comparatively little expense aids materially in making the farm self-sustain-

OAT FIELD.



ing; for, besides being one of the best forage crops, oats add greatly to the fertility of land on which they are raised.

In 1890 the area devoted to oats in Georgia was 516,886 acres, and the production was 4,767,821 bushels. There was a slight falling off in acreage and production in 1899. In 1900 the area devoted to oats was 467,336 acres and the production was 7,010,040 bushels, valued at \$3,434,920. The stock on hand March 1, 1900, was 1,121,606 bushels. There were 140,201 bushels shipped out of the counties in which they were raised.

Among well-authenticated extraordinary yields of oats in Georgia are the following: 137 bushels to the acre on a farm in Wilkes county and 131 bushels in DeKalb, both of these counties being in Middle Georgia; 121 bushels in Floyd county, Northwest Georgia; 115 bushels in Coweta county, Middle Georgia; 100 bushels in Schley county, Southwest Georgia; 75 bushels in Brooks county in the extreme south of the State. Thus we see there are lands well adapted to oats in every section of Georgia.

Rye.—This is one of our best green forage crops, but is not so extensively cultivated in Georgia as oats. In 1899 the area devoted to rye was 15,805 acres and the yield was 94,830 bushels, a falling off in acreage, but an increase in yield over the crop of 1890, when 20,949 acres produced 87,021 bushels. The area sown with rye in 1900 was 15,647 acres and the yield was 109,529 bushels valued at \$112,815.

Barley.—Barley is by some valued more than rye, and is generally sown about the same time; but in Georgia not much attention is given its cultivation, as may be seen by the fact that in 1890 the area given to barley according to the United States Census was only 549 acres with a yield of 6,053 bushels. In the Year Book of the United States Department of Agriculture for 1900 Georgia is not credited with any barley, though it is well known that several Georgia farmers did raise it. It would pay our farmers to give more attention to both rye and barley.

Rice.—In China and India, the original homes of the rice plant, many varieties are known. But in America the common distinctions are upland and lowland. Its introduction into South Carolina in 1700 is said to have been accidental. It was carried also to Louisiana, which State leads all others, with South Carolina second and Georgia third. In 1890 the acres devoted to rice culture in this State were 18,126 and the production was 14,556,432 pounds. There have been for several years past fluctuations in these figures. One hindrance to its production has been the lack of a sufficient number of mills for cleaning it. This is particularly true of upland rice, to the cultivation of which much attention is being given in Southwest and also in Northeast Georgia. Milling facili-

ties have been greatly improved of late, which will lead to a considerable growth of this industry. Improved modern machinery for use in its cultivation may be expected to impart fresh impetus to the growth of this important cereal. The planters of Louisiana have replaced the antique implements of the hand laborer by the gang plow, disk harrow, drill and broadcast seeder. In the cultivation of the lowland rice where water is needed, if there is not a sufficiency of water, this is secured by irrigation canals. In the cutting of rice, the twine binder of the northern wheat fields is a very useful implement. The average yield of rice to the acre in Georgia is 800 pounds. Some well-authenticated yields of upland rice are: 100 bushels or 4,300 pounds to the acre in Hall and White counties of Northeast Georgia, Pike county of Middle Georgia, and Early county of Southwest Georgia. The present production of rice in the United States falls far below the needs of our people. In some seasons the imports are half as much again as we raise, sometimes they equal the domestic crop, and sometimes are even greater. Inasmuch then as the amount produced in this country falls below our own needs, there is room for great increase in the cultivation of rice. To men of enterprise and thrift wishing to embark in this business Georgia presents a promising field.

In 1900 Georgia produced 7,500,000 pounds of rice, a decrease of more than 50 per cent. since 1890.

Sugar-Cane.—Sugar-cane yields a handsome profit. A steadily increasing demand for sugar and molasses in the United States makes it certain that there will always be a ready sale for the product of the sugar-cane. Over large areas of the United States sugar and various syrups are being extracted from the beet cultivated for that purpose. But no other known plant equals the *sugar* or *ribbon-cane* in its capacity for supplying those two articles of universal consumption. When we consider that from 1880 to 1895 the United States produced only one-tenth of the sugar consumed in this country, and paid out \$1,500,000,000 for imported sugar, it can be readily seen that there is no immediate danger of overstocking the market. The 20,000 acres in Georgia devoted to the sugar-cane in 1890 produced 1,307,625 pounds of sugar and 3,223,194 gallons of molasses. Some of the best yields were: 700 gallons of syrup to the acre in Bulloch county; 695 gallons in Thomas county; 600 gallons in Brooks county, and 480 gallons in Burke county. Of these counties Burke and Bulloch are in the northern part of the Southern Georgia belt, while Brooks and Thomas are in the extreme south on the Florida line. In Rockdale county in Middle Georgia 600 gallons of cane syrup were the product of one acre of the farm of Hon. W. L. Peek.

The growing of sugar-cane and manufacture of syrup in South Georgia has doubled in two years. Twenty-five thousand barrels of syrup have been sold in one year from a small section of the extreme southern part of Georgia. In the fall of 1899 a gentleman in Tennessee sold 150 barrels of Georgia syrup in six days. A great deal of it has been sold to people in Cleveland, Cincinnati and Boston, who, after mixing it with glucose, put the blended article upon the market as Georgia White Syrup.

The planters are finding out every year that no country on the face of the globe can make as good syrup as Southwest Georgia, and are increasing their acreage. Before many years this industry will equal that of cotton. Pittsburg, Pa., is getting to be a strong market for Georgia syrup. The present estimate is that the sales of Georgia syrup in Pittsburg for the year will amount to 10,000 barrels. A sample of Georgia cane tested by Professor Wm. C. Stubbs of New Orleans, in 1899 showed $16\frac{1}{2}$ per cent. sugar content and not quite one per cent. glucose, with a purity coefficient of nearly 90 per cent. Another sample contained $13\frac{1}{4}$ per cent. sucrose (cane sugar), and only 1 and four one-hundredths per cent. of glucose, with a purity coefficient of 81 per cent. This means more than 12 per cent. of sugar available in ordinary mills, and upon a 75 per cent. extraction would be equivalent to 180 pounds of C. P. sugar to the ton of cane, or nearly 200 pounds of commercial sugar as usually made in Louisiana sugar-houses from firsts, seconds and thirds. The better grade of lands with ordinary cultivation and fertilization will yield from twenty to twenty-five tons to the acre, and the same land under the best methods will yield from thirty-five to forty tons to the acre.

Professor Stubbs, already mentioned, is authority for the statement that the price per ton of sugar-cane in Louisiana will average about 80 cents for each cent that prime yellow clarified sugar is worth on the New Orleans market.

Hence, if prime yellow clarified sugar is worth five cents a pound, the price for a ton of cane will be five times eighty cents, or four dollars a ton.

The number of gallons of syrup that can be obtained from a ton of Louisiana cane will depend entirely upon the extraction of the mill and density of juice. A mill getting as high as 75 per cent. extraction, or fifteen hundred pounds of juice to a ton of cane, will give from twenty-five to thirty-five gallons of syrup cooked to a density of 34 degrees Baumé. The variation is due to the "total solids" contained in the cane juice. The same statement will apply to Georgia cane.

A complete plant for making syrup can be obtained at several places in the United States. But probably the most improved machinery can

be better obtained in New Orleans, where every manufacturer is familiar with its practical use. For an up-to-date factory there is needed a first-class mill with filter presses, clarifiers and evaporators. There are also needed settling tanks, juice tanks and syrup tanks.

Any one who contemplates embarking in the business of syrup-making, should study the question of sterilization of syrup, which can now be easily done. The syrup, after being sterilized, must be put into sterilized vessels, where it will keep indefinitely, if the work has been well performed.

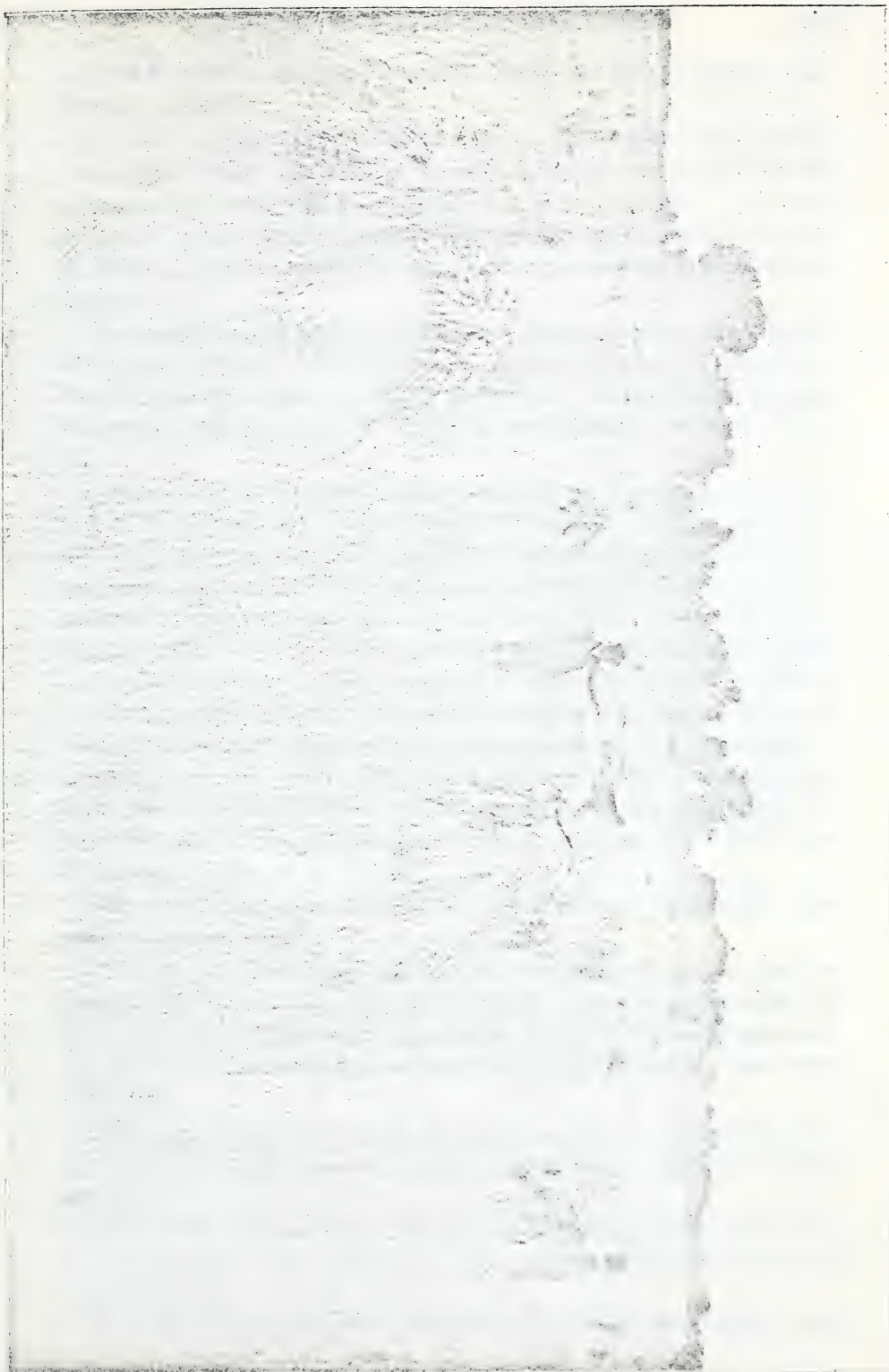
Soils adapted to cane are those naturally rich and fertile, though upon soils of very moderate fertility, well prepared and fertilized, remunerative crops can be grown. In cane culture climate, rainfall and manures are more important factors than soils. In sandy soils without manures the cane is small. Calcareous soils develop a superior cane, rich in saccharine matter. On rich alluvial soils, not properly drained, the canes are poor in sugar produce, and though they yield a large quantity of syrup, it is not a first-class article.

As to whether the entire cane should be planted or only that portion which is the least fitted for making sugar Dr. W. C. Stubbs of Louisiana says: "It can be positively asserted that the upper third of our canes can be profitably used for planting our crop, and we can send the lower two thirds of our entire crop to the sugar-house, thus increasing largely our sugar yields and diminishing our heavy outlay annually for seed."

Before planting all soils should be well-prepared, properly fertilized, and perfectly drained. It is best to break or flush the land, then bed into rows from five to six feet wide; then open the bed and in this furrow plant the cane. The part of the stalk selected for seed should be deposited in an open furrow and well covered. In the fall this covering should be several inches thick. Remove the extra soil in early spring to secure early germination. The cultivation best for corn land is generally good for sugar-cane. Let there be thorough and deep preparation of the soil; then cultivate rapidly and as shallow as the soil will permit, and "lay by" when canes shade the ground.

The fertilizers for cane should contain enough nitrogenous matter to insure a large growth by September 1st. Phosphoric acid is very beneficial to cane. Potash may be demanded upon light sandy soils. Experiments have shown that the limits of profit in the use of fertilizers are between forty and fifty pounds of nitrogen obtained from cottonseed-meal, and from forty to eighty pounds of phosphoric acid.

If under favorable conditions the above formula is used on our best



HARVESTING RYE.

cane lands in South Georgia, we should obtain from twenty to thirty tons of cane to the acre.

It should be remembered that Georgia was the original cane-growing State of the Union. In 1825 she gave to Louisiana the seed of the ribbon-cane, thus bequeathing to that State a mine of wealth. And now the genial soil of Southern and Middle Georgia offers this same source of wealth to her own people or to the stranger seeking a home within her gates.

The establishing of sugar refineries will greatly promote the interests of the cane growers. There will be no scarcity of capital for such enterprises if sufficient quantities of cane are grown. We predict for the near future the establishment of a number of sugar refineries in South Georgia.

Syrup-making in Georgia commences about the last of October or the first of November, and continues until Christmas. At this season the traveler journeying on a country road will see on almost every farm the smoke issuing from the syrup furnace, an invitation to either neighbor or stranger to enter the home and share the hospitalities to which every one is made to feel welcome in cane-grinding time. Here youths and maidens, with those of riper years, engage in the sports of the holiday season, or seated near the cheerful fire regale themselves with the healthful and delightful beverage extracted from the sugar-cane. At this season of cane-grinding and syrup-making, the sick and feeble recuperate and often find their health again. The negroes, too, both young and old, have their part in the good cheer, and even the stock upon the farm share in the general glee.

The stalks of the cane shredded are worth more as forage than corn-stalk or cottonseed-hulls.

The little, old-time sugar mill on each man's farm ought, in this progressive day, to give place to well equipped, up-to-date syrup mills and sugar refineries. This would transfer the syrup-boiling and sugar-making to the mill, just as cotton is taken to the factory, and not spun upon each farm.

If the most improved methods are used, the cost of extracting the juice from the stalks and converting it into syrup is a mere fraction of a cent per gallon.

It has been estimated that the average farmer can count on getting \$120 gross to the acre for syrup, at a general average product of 600 gallons to the acre.

In 1890 the area devoted to sugar-cane in Georgia was 20,238 acres,

which produced 1,307,625 pounds of sugar and 3,223,194 gallons of molasses.

In 1890 the area devoted to sorghum in Georgia was 22,089 acres, which produced 1,342,803 gallons of molasses.

CASSAVA.

Recent experiments go to prove that cassava will make a profitable crop for South Georgia. The species of this plant recommended for Georgia, is the sweet cassava, which does not, like the bitter cassava, require boiling to drive out poisonous juices, but can be fed to stock in its natural state without risk of harm. It also makes a very palatable table vegetable. But its chief excellence consists in the fact that it yields abundance of the best starch. One acre of South Georgia land planted in sweet cassava will yield 4,000 pounds of starch, while the best corn or potato lands in Illinois or Michigan can produce only 1,200 pounds of starch from these vegetables.

Cassava is easily propagated by cuttings of the stem and grows rapidly, attaining maturity in six months. The production is at least sixteen times that of wheat.

When the farmers of South Georgia become thoroughly convinced of its worth and embark extensively in its cultivation, starch factories will be started on every hand. It has been estimated that these will pay five dollars a ton on the cars, at any station within one hundred miles of their factory.

With sugar-cane and sugar refineries, cassava and starch factories, South Georgia possesses grand opportunities for profitable farming.

GRASSES AND FORAGE CROPS.

If it be true that the farmer's only capital is his land, how important it is for him not only to preserve his capital but to increase it year by year. There is no surer or easier way to do this than by growing the grasses.

The value of the hay crop of the United States exceeds that of the cotton crop by more than fifty million dollars. The present race of planters grew up under a condition of things which looked to cotton as the sole market crop and since grass was the deadliest enemy to cotton the energy of the planter was directed to the complete extirpation of all the grasses of the field. But in recent years new light has dawned upon our progressive farmers, and in every section of Georgia the grasses and for-

age crops are receiving, to some extent, the attention which they deserve. While we recognize cotton, when cultivated upon a true business basis, as a great source of wealth to Georgia, yet we must remember that its culture is attended with great expense, since it requires constant attention and work from January to January. This labor largely consumes the profits, whenever cotton sells below seven cents a pound. If we look upon an agricultural map of the United State, we shall find that lands sell at the highest price in those States, or parts of States, where the grasses and forage crops are cultivated with the greatest attention. On the other hand we shall see that lands sell cheapest in these States or parts of States, that raise all cotton and kill all grass. Hence we conclude that the value of land increases in proportion to the attention given to the grasses and forage crops. If we turn to Europe, we find a similar state of affairs.

Spain grows practically no grass and has cheap lands, while Holland is known as a vast grass meadow, and some of her farm lands sell at \$800 or \$1,000 an acre.

Therefore, every farmer who wishes to enhance the value of his land should give attention to the cultivation of the grasses and forage crops. Georgia is rich in native grasses, and it has been fully demonstrated by some of our intelligent, wide-awake farmers that the artificial or foreign grasses also thrive well in Georgia soil. In fact, when we consider the entire year, Georgia and other States of the South offer better advantages for these crops than the North. While Georgia's acreage in hay is small compared to that of States which make it one of their principal crops, yet she ranks high in her average yield to the acre. Georgia's acreage in hay has not quite doubled since 1890, but her yield has more than doubled. Her hay crop for 1900 amounts to 190,237 tons, being an increase of 120,468 tons over that of 1890.

Alfalfa, or lucerne, is cultivated to some extent in Georgia, although it has not received the attention that its merits should claim. Among all the forage plants it stands unrivalled for abundant yield, longevity and hardness. It flourishes under heat that would destroy any other species of clover. Over the entire plant are scattered purple, pea-like flowers, in long, loose clusters or racemes. It is not affected so much by altitude as by the depth and warmth of the soil, and the depth of the water-table beneath the surface. A rich, sandy loam, limy, with a porous subsoil, suits it best. A considerable amount of sand in the soil is not injurious to it. It will grow on favorable soils at almost any altitude, from sea level to 7,000 feet above the sea.

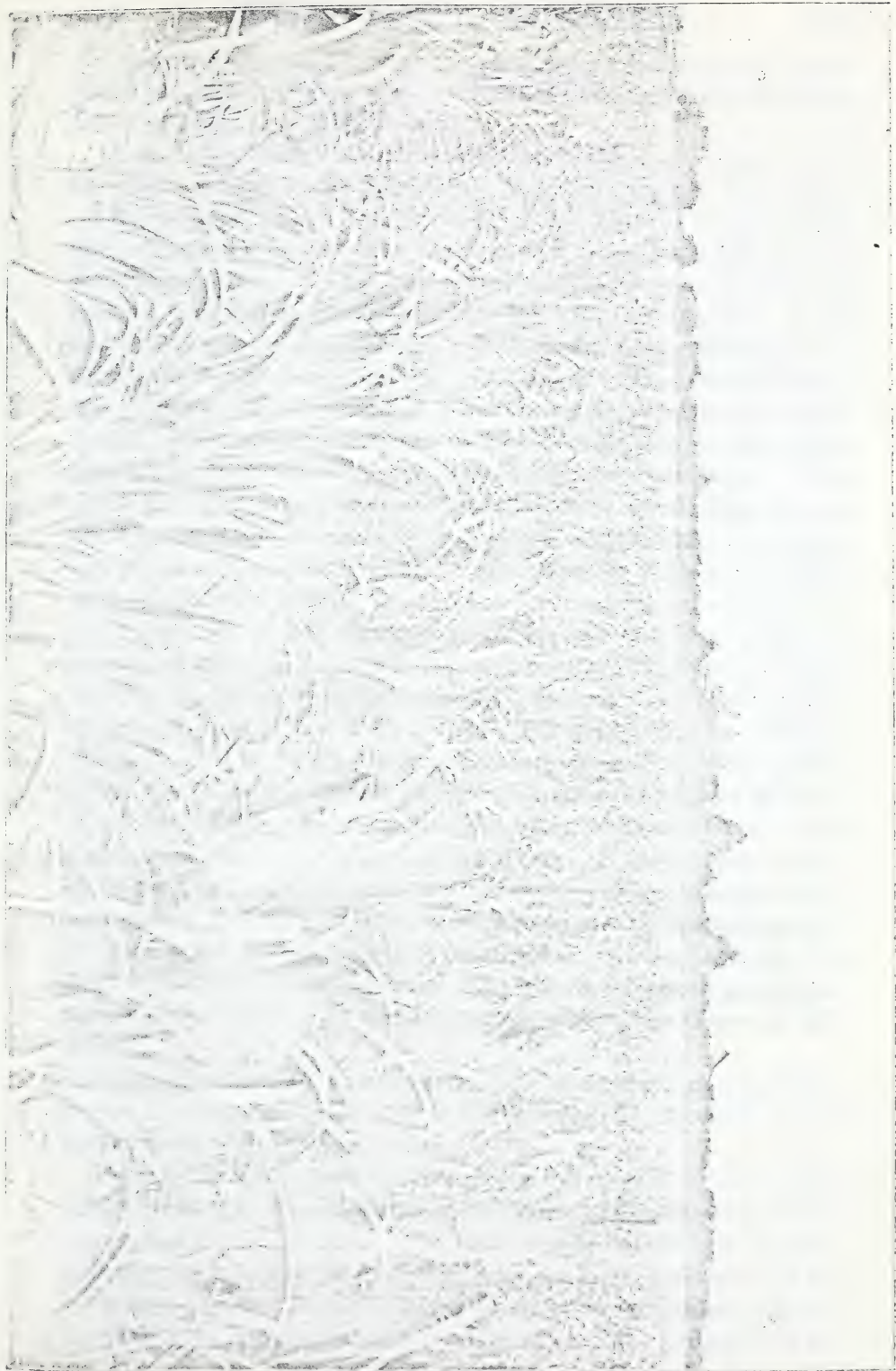
Alfalfa, when young, is very delicate and requires much nursing. No

crop requires more careful preparation to secure a good stand. But when it is planted upon suitable soil, and a good stand is obtained, it may yield luxuriant crops for thirty or more years. It rarely grows tall enough the first year to be mowed for hay. It reaches its best growth during the third year. When properly managed up to that time the number of cattle, which one acre of it will keep by soiling throughout the whole season, is something wonderful. While this is a good grass for hay, it is not good for pasturing. The trampling of stock compacts it so much that the plants deteriorate. Hogs, however, do not injure it like heavier stock. Hence it may be used as pasture for them, and one acre will furnish abundant forage for from ten to twenty hogs throughout a season.

Bermuda grass is perennial and is the most valuable for pasturage of any grown in the Southern States. It can endure the greatest amount of summer heat, and its growth is not arrested by droughts that threaten the vitality of all other grasses. It does not propagate grass by seed, except to a limited extent. The best means of propagating it is to cut pieces of the turf and scatter it along shallow furrows, or sow it over the land well prepared by plowing and harrowing, and cover or compress the roots into the soil with a roller or drag brush; or the plants can be gathered, root and branch, from any patch of ground covered by them, and, after being shaken free from earth, passed through a cutting-box, as though being prepared for the stall. Then sow these little cuttings by hand broadcast before the harrow in the spring of the year. Every joint will germinate and bud. When Bermuda grass is once thoroughly rooted it spreads rapidly and soon takes possession of a field. Being extremely difficult to exterminate, it should not be planted on land intended for tillage. But Rev. C. W. Howard, who was in his life-time a well-known writer on grasses, thought it very doubtful whether any acre of land in the South thoroughly set with Bermuda grass was not worth more than with any other crop that might be grown upon it.

"A good Bermuda sod," says a writer in the *Southern Farm Magazine*, "will yield an almost incredible amount of pasturage that cannot be grazed out by the severest treatment in the hottest summer drought. Bermuda is highly esteemed for hay, wherever it grows to a sufficient height for mowing." It must be cut early and often to make good hay. When left until the culms harden, it will not do for feeding. To make good hay and make the largest yield, it should be mowed from three to five times every summer.

Under the Bermuda sod large numbers of earthworms may be found. These add fertility to the soil, and when in summer hogs are turned into



SUGARCANE FIELD

the pasture, the worms and grass combined make a fattening food which they much enjoy. Bermuda grass will not bear dense shade, but thrives best where most exposed to the sun.

On the same fields where cotton grows best Bermuda grass is most thriving. A grass which affords such excellent pasturage for cattle is capable of carrying also large flocks of sheep. There is no reason why the cheapest wool should not be produced on the same lands that produce the cheapest cotton. It has been estimated that one acre of Bermuda grass on soils entirely suited to its growth will, in many parts of the South, maintain ten sheep for ten months of the year. Bermuda grass pastures in Georgia, supplemented by pasture of winter grasses, suitable for grazing sheep, would add to our people another source of untold wealth. If Georgia should become a great wool-growing, as well as cotton-growing State, who can measure the degree of her prosperity? With cotton and wool, two of the most important fibers for clothing that the world produces and manufactures, our people would double their present opportunities for acquiring wealth. Dr. Thomas P. Janes in his "Hand Book of Georgia," in order to illustrate the fertilizing effects of a Bermuda grass sod of long standing, mentioned the following results obtained by Colonel A. J. Lane in Hancock county: "The first year after breaking the Bermuda sod he harvested 1,800 pounds of seed cotton to the acre, the second year 2,800 pounds. His third crop, corn, manured with cottonseed in the usual way and quantity, yielded sixty-five bushels to the acre. The fourth year he harvested forty-two bushels of wheat to the acre. Neither the cotton nor wheat was fertilized. On this same land oats or wheat may be sown after the corn. If Bermuda sod is torn up by the plow, and after harrowing, but before rolling, blue grass seed, white clover and hairy vetch are sown, a pasture of the highest capacity for both winter and summer will be obtained. As the Bermuda dies down in the late fall, the blue grass and white clover appear, giving pasturage in the winter. As the summer approaches, the reverse of this occurs.

It will be well to bear one thing in mind. The cultivation of artificial grasses is accompanied with more or less expense. But Bermuda is within easy reach of the poorest farmer.

The celebrated *blue grass* of Kentucky and Tennessee is used in considerable extent in Georgia for lawns and yards, and thrives very well in some of the soils of the State. The Texas blue-grass, which, as its name indicates, is a native of the Lone Star State, is a hardy perennial and has a vigorous growth. Fertile soils, especially calcareous loams, will produce this grass in great luxuriance. It is an excellent pasture grass for

the extreme south, and remains green throughout the year, growing through the winter months and blooming in the latter part of April or the first of May. It also is well adapted to Georgia.

Meadow oat grass is excellent as a winter pasture grass. It will grow on more sandy soil than most of the artificial grasses; but rich upland is the proper soil for it. It is good not only for winter pasturage, but also for hay. It matures so rapidly that seed sown in the spring will produce seed in the fall. Since the seed becomes ripe, even while the stalk is green, it can be saved by cutting off the heads with a cradle and tying in bundles, after which the rest can be mowed for hay. Cattle should not graze upon it in summer and fall. After Christmas they can feed upon it until the latter part of February, or even later, until the other grasses spring, unless it is designed to make hay of it.

Orchard-grass, so called because of its growing wild in orchards or in thinned woodland, is next to the tall meadow oat-grass for winter pasturage or for hay. In order to be sweet and nutritious it should be cut as soon as it blossoms.

Crab-grass is indigenous. It is never sown, but, wherever cultivation ceases, takes possession of the fields. It forms an excellent pasturage through the summer and until late in the fall. It grows very rapidly after oats, and if cut when in flower, gives a very large yield of hay, and sometimes yields more forage than the oat crop that preceded it. This grass sends out numerous stems, branching at the base, but forms no sod.

Crowfoot grass is confined to the lower and sandy part of Georgia. Both this and crab-grass should be cut as soon as they are in blossom.

Crimson or scarlet clover is an annul, and grows to the height of three feet on good soil. It should never be fed to stock after the crop has ceased flowering, and the practice of feeding stock with the straw after it has been raised and threshed as a seed crop should be avoided. It makes excellent pasture during the fall months, when other green crops have dried up. For green manuring it ranks high. Having made its growth during the fall and winter months, it can be turned under in the spring. It should always be sowed alone, as it needs all the land. It is excellent food for milch-cows, since it causes a full flow of rich milk. A rich clayey loam containing more or less carbonate of lime, and yet not a calcareous loam, suits it best. After the clover has been cut in the spring the same field may be planted in corn.

Red clover thrives on land of moderate fertility, such as will produce remunerative crops of wheat or corn. With the right treatment red clover will succeed in Georgia. It has been tested with successful results

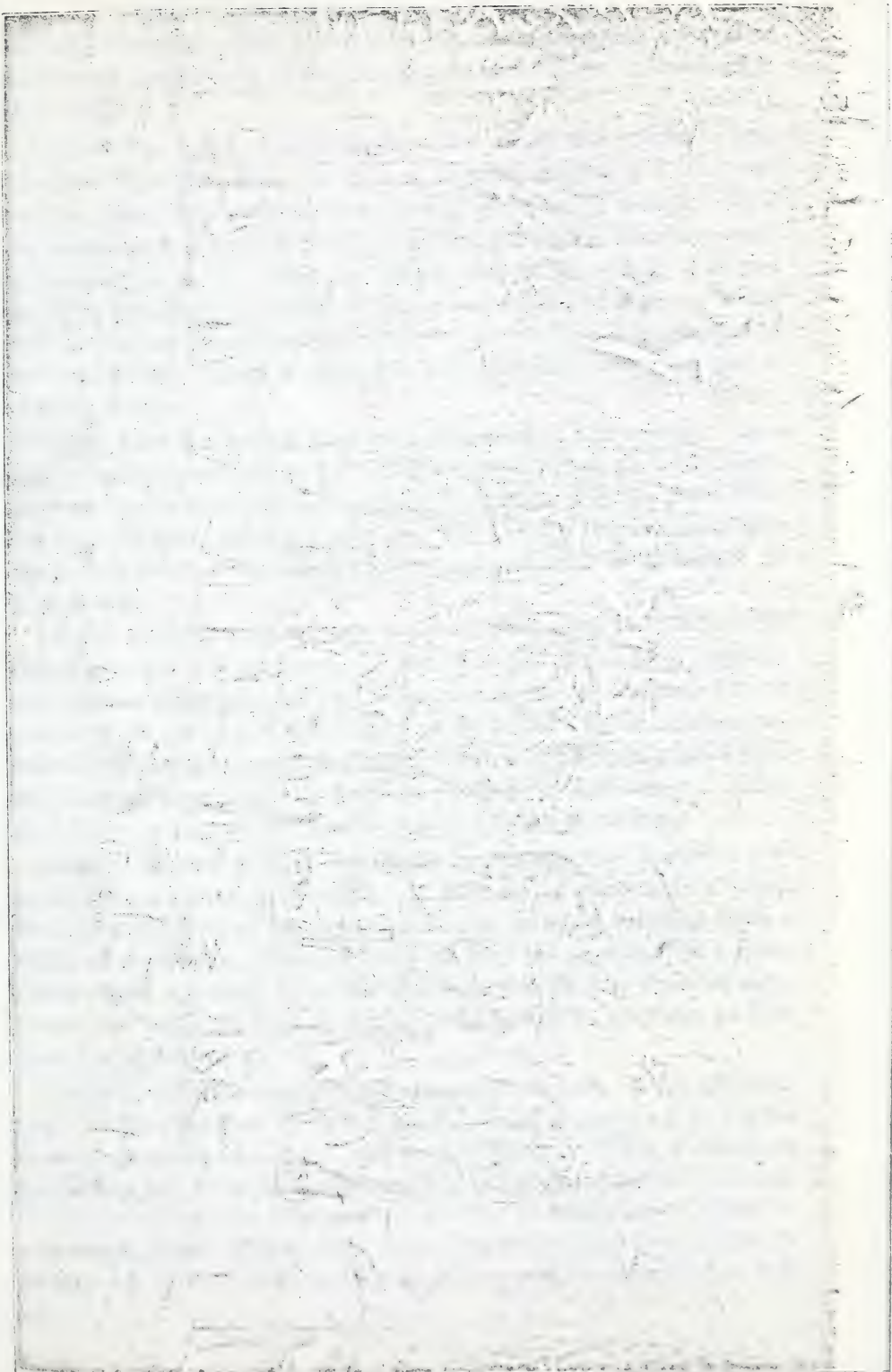
Italian rye-grass is short-lived, having a duration of two or three years. It grows best on rich, moist alluvial lands and calcareous loams. It is a very valuable grass when early forage is desired. Indifferent to climate and texture of soil, it requires only dryness and richness. It grows successfully in every part of Georgia. If sowed in August or September it will be ready for grazing in February. Although it yields largely for hay or winter grazing, it is doubtful whether it be more valuable than barley or rye for these purposes.

Cow-peas and peavine hay have come into universal favor in all the Southern States. Up to about thirty years ago their cultivation was confined mainly to the cotton-growing States, but now they are a staple crop even in the border Southern States. They have in many localities taken the place of clover, and may appropriately be called the clover of the South. The pea-vine is a leguminous plant and appropriates nitrogen from the atmosphere, as do all other plants of the same family. The vine and peas supply as much humus to the ground as clover, and can be grown upon soils, in which clover would wither and die. The peas can be sown in Georgia at any time between April 1st, and August 1st, and the soil may be prepared by breaking it with a two-horse plow. About one bushel and a half to the acre should be sown, after which the ground should be well-harrowed. Some farmers prefer to drill the peas in rows, from two and a half to three feet apart, placing the peas at intervals of one or two inches in the row. After they have come up a cultivator should be run between the rows. Peas furnish a large amount of feed if planted between the corn rows at the second or last plowing of the corn.

The hay should be cut when the first pods begin to turn yellow, and while the leaves are yet green and the stems tender. If cut after all the peas have thoroughly ripened, the stalks will be hard and the leaves will fall off. They should be cut in clear weather and after the dew is off. There are many varieties of the pea. Those commonly used in Georgia are the whippoorwill, the black clay, the red clay and the unknown. There is no better soil renovator than the cow-pea. The most worn-out soil can be brought to a condition of profitable production by planting a succession of cow-peas upon it.

Valuable as is the pea-vine for food, its chief excellence is this property of restoring exhausted soils. It surpasses, perhaps, all other leguminous plants in producing maximum results in a minimum of time. In Georgia cow-peas are planted in the late spring or early and middle summer, and the crops of vines are either harvested for hay or buried for fertilizing in the early fall. The more economical plan is to harvest the crop

FIELD OF BROOM-COIN.



for hay, then turn under the stubble and the roots, which are said to contain the greater part of the elements so essential for the renovation of the soil.

The *vetch* is found in two varieties, the winter and summer vetch. The latter is of very little use to us in Georgia, because it will not for summer soiling yield as large an amount of green forage as corn. Since the winter vetch is ready for the first cutting during the first warm spell in February, it is very useful for soiling early in the spring. The seed should be sown early in August, allowing one bushel to the acre. Where land has been well manured, the vetch or tare yields a large amount of early cut food, or it may be made into nutritious hay, or may be used as a winter pasture.

Eight varieties of *millet* have been cultivated in this country. It is used for soiling purposes, for hay and for its seed. More than fifty bushels of seed to the acre have been raised on rich land. The hay made from it is of good quality and large quantity. But Captain Howard says: "For forage purposes it is not superior to oats and is inferior to the vetch. It is an annual."

All the millet family requires a strong, rich, deep soil, sufficiently clayey to retain a large amount of moisture; but at the same time the land must be thoroughly drained. The most favorable conditions for the growth of a large crop of millet are a clayey soil in a moist situation, enriched by the application of well-rotted stable manure, kept in good tilth and thoroughly prepared by frequent plowings or harrowings. Millet must be cut as soon as it begins to head and before it blooms.

Gama or Sesame grass is one of the largest and most beautiful perennial grasses grown in Georgia. It is a native grass and is found throughout the South from the mountains to the coast, reaching often a height of seven feet. The seed break off from the stem as if in a joint, a single seed at a time. The leaves are very much like those of corn. Horses and cattle are fond of the hay, which may be cut three or four times during the season.

Herd's-Grass is the most permanent grass for all soils. It is a universal feeder and is therefore of special value to every farmer. It is a good meadow grass and one of the best pasture grasses. When it has been cut for hay, its aftermath makes excellent late summer and fall pastures. It may be sown in the fall or in the spring. It may be sown alone, or with wheat, barley, rye, or oats. It is often sown with other grasses, as timothy and clover. This herd's-grass is known in New England as red-top.

Timothy, sometimes called cat-tail, is also called herd's-grass. It is useful only for hay. The well-drained rice land of the Georgia coast will produce it in perfection, as will also the richest of bottom land that is dry enough for wheat. It should be cut when in full bloom.

Brome, cheat and rescue grasses, belonging to the same family, make a very good winter pasturage, but are liable to some objections.

Peanuts or ground-peas, which when parched, are so much relished by young and old, and have such ready sale everywhere, are also fine forage for cattle and hogs. The white peanut grows with spreading branches that lie flat upon the ground; the red has an upright growth. Spanish peanuts are earlier than other varieties and have an upright growth like the red. This is the surest crop of the three. Those grown in the far south are valuable for making peanut oil. The harvesting must always take place before frost. The usual yield to the acre is from thirty to fifty bushels, though sometimes as high as a hundred bushels are made. When carefully harvested before frost the vine makes an excellent food for cattle and sheep. Ewes in lambing time can have no better food given them than well-cured peanut hay, because it increases the flow of milk and adds richness to it.

Corn, when desired as a forage crop, is planted very close together, and on rich and well-prepared soil, makes an enormous yield. The whole crop is cut while yet green and tender, and properly cured. If desired as ensilage it is cut up green and deposited in a silo pit.

Cane forage is prepared from the sorghum cane, grown in the same way as the corn forage, and gathered and cut up in the same manner.

The millets, or any of the grasses, including peavine and peanuts, may be gathered green and stored in the silo.

The Soja bean ranks among our best crops, both as an improver of soils and as food for stock, as will appear from an analysis taken from the United States Agricultural Department:

AS A FOOD

SOJA BEANS	Protein Per Cent	Fiber Per Cent	N. Free Extract Per Cent	Fat Per Cent
Green fodder.....	4.0	6.7	10.5	1.0
Dry fodder.....	14.4	22.3	39.6	5.2
Grain.....	34.0	4.8	23.8	16.9
COW PEAS				
Green fodder.....	2.4	4.3	7.1	.4
Dry fodder.....	16.6	20.1	42.2	2.2
Grain.....	20.8	4.1	55.7	1.4

AS A FERTILIZER

	Nitrogen Per Cent	P. Acid Per Cent	Potash, Per Cent
Soja beans	2.32	.07	1.08
Cow peas	1.95	1.05	.52

As you will understand *protein* furnishes the materials for lean flesh, blood, muscles, hair, wool, albumen of milk, etc., and is a very important ingredient of all feeding stauffs. *Fiber* is the framework of plants. The coarse fodders, as hay straw, contain a large proportion of *fiber*, hence less digestible. *Nitrogen free extract* includes the sugar, starch, etc., and forms an important part of stock feed, especially the grains. *Fat* includes besides real fats, wax, the green coloring matter of plants, etc. The culture of the Soja bean is very much like that of cotton. The rows should be from three to five feet apart.

Arctic, or rescue grass thrives best in North Georgia and is held in high esteem by some of the farmers of that section. It will readily yield from 1,500 to 3,000 pounds of hay to the acre. It can be sown in July with peas, or in August, September and October. If sown then it makes a fine winter pasturage, and cattle can be kept upon it until the first of March without injury to the crop, which can be cut from May 15th to June 15th. But the rescue grass (*bromus inermis*) must be carefully distinguished from cheat (*bromus seculinus*).

To show what can be done with the grasses and forage crops in Georgia, we give the following trustworthy reports of the work of some of our best farmers: In Bibb county on the border of Middle and Southern Georgia there were cut 8,046 pounds of crab-grass hay to the acre; in Gordon county in Northwest Georgia, 9,400 pounds of lucerne to the acre; in Greene county in Middle Georgia, 13,953 pounds of Bermuda grass hay to the acre; in Spalding county in Middle Georgia 10,720 pounds of pea-vine hay; while of clover hay there were cut in Greene county, Middle Georgia, 10,000 pounds to the acre; in Cobb county 6,575 pounds to the acre, and in DeKalb county 16,000 pounds to the acre, both of these last two counties being in Northwest Georgia on or near the northern line of the Middle Georgia belt.

Greene county reports a yield in corn forage of 27,130 pounds to the acre.

The hay crop of Georgia in 1900 was 190,237 tons, valued at \$2,425,522. The area devoted to this crop was 112,566 acres, and the average yield per acre for the entire State is 1.69 tons, or 3,380 pounds.

Again we say there is no industry that will make so much money to the

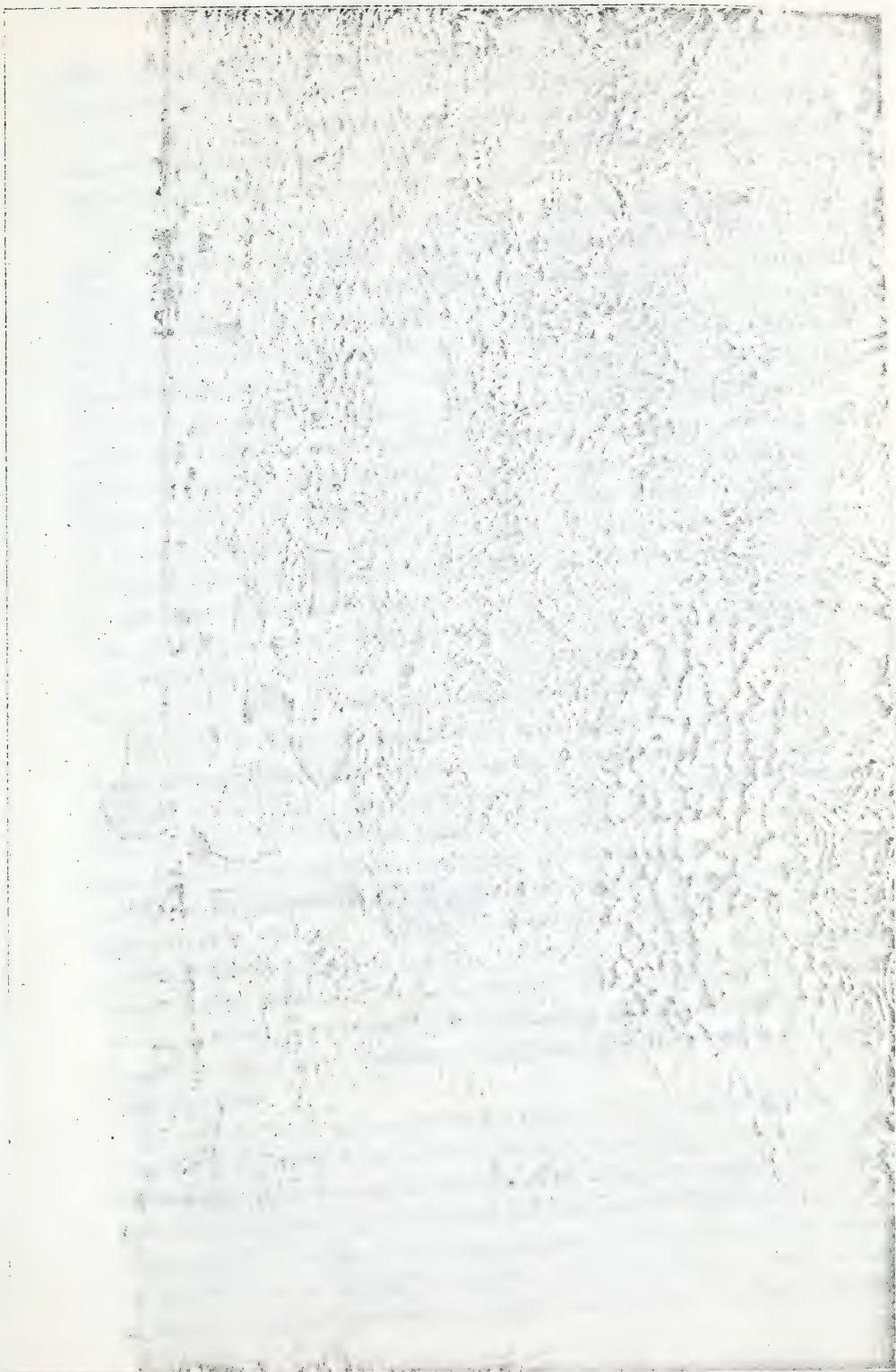
farmer at such small outlay of expense and labor, as the cultivation of the grass and forage crops. We give as an illustration of what can be done on this line in Georgia, the case of Mr. N. B. Moore, who lived in Augusta and was a gentleman well-known through all his section of the State. He was one of the pioneers who blazed the way to success in this important field. Soon after the disastrous close of the civil war he devoted himself to grass culture, planting nothing else on his farm of one hundred acres of Savannah river land, near Augusta. From these one hundred acres he derived an income of from seven to ten thousand dollars a year. When the season was propitious his land afforded three or four cuttings. His barn held two hundred and fifty tons of hay. He made it a rule that the grass cut at noon should be put up with horse sulky rakes, in cocks, before sundown. Perhaps it is not inappropriate to say that he believed strongly in paint for the preservation of every tool, and that after more than twenty years of use his wagons, carts and harrows were perfectly sound. The citizens of Augusta and Richmond county, who knew of his wonderful success, were prepared to give considerable credit to his expressed opinion that "farmers, as a class, to be successful, require more brain than any of the so-called learned professions."

The success of other farmers who have embarked in grass culture has been so wonderful that there can no longer be a doubt in the mind of any one as to the adaptability of Georgia soil to this wealth-producing industry. What is better evidence of a well-managed farm than extensive fields of waving hay ready for the reaper, or the green carpeted meadow on which are grazing herds of sleek cattle suggestive of rich cream, milk and butter, or juicy steaks, and where the horses that enjoy its bounteous feast will compare favorably with the best bloods of Kentucky? The well-mowed lawn, too, that skirts the gravel walk and spreads out in front of the farmer's neat cottage or stately mansion, and through his grass and forage crops not only fills his barns with plenty, but also adds to his bank account the handsome profits that accords testimony to refinement, culture and good taste.

A farm and home like this are within the reach of the Georgia farmer who, devoting only a part of his land to cotton, raises his own supplies, crue from the sale of the vast surplus remaining after all the needs of himself and farm have been fully met.

POTATOES.

"The South is awakening to new industries, and broader fields of usefulness." The good work is going on with increasing impetus in this



year of grace, 1901. Georgia is progressing on all lines. In this chapter, however, we are speaking of diversified farming.

The potato crop is another source of wealth to Georgia. Both Irish and sweet potatoes make good yields; but the acreage and production of the latter are much larger than of the former.

The Sweet Potato.—In sweet potatoes Georgia comes just behind North Carolina, which State ranks first in this product. The soil is well adapted to their culture, and when the season is propitious the yield is very abundant. Not only is this a favorite crop for home consumption, but great quantities are exported to the northern States. In some sections they are used also for fattening hogs. The average yield is $78\frac{1}{2}$ bushels to the acre. Very large yields have been reported from some of the best farms, viz.: 800 bushels to the acre in Berrien, Crawford and Richmond counties; 500 bushels in Brooks county, and 400 bushels in Fulton county. Of these counties Brooks is in the extreme southern part of Georgia, Berrien just north of it, Crawford partly in southern, partly in Middle Georgia, Richmond and Fulton in Middle Georgia, the last on the edge of Northwest Georgia. By the census of 1890 the production of sweet potatoes in Georgia was 5,616,317 bushels, worth \$3,250,000, raised on 71,399 acres. No report has yet been received of the acreage and production of sweet potatoes in Georgia for 1900.

The Irish Potato.—At one time the Irish potato crop was entirely for home consumption. The demand for early vegetables in the northern markets is such that it has caused a great increase in the cultivation of Irish potatoes, and the truck farmers of Georgia have not been slow to take advantage of this fact. Ordinarily two crops are made in the year, and there is one instance of a gentleman in Decatur, Georgia, who raised three crops in one year. Taking the average of all lands, good and bad, the yield is $74\frac{1}{2}$ bushels to the acre, something less than the average of sweet potatoes estimated in the same way. But as many as 420 bushels to the acre have been raised in Wilkes county, Middle Georgia, and 109 bushels to the acre in Walker county, among the mountains of Northwest Georgia.

There is no need to be apprehensive about an overproduction of Irish potatoes in Georgia. Like all other crops of vegetables, berries and fruits the Georgia products are so much earlier upon the market, that they preclude all competition. Our Irish potatoes command the early and best prices and the Georgia truck farmer cannot be forced out of the market by his Western or Eastern neighbors. In April, 1895, a truck farmer of South Georgia shipped to the Eastern markets one hundred and fifty

barrels of potatoes, which brought him \$7.50 a barrel or \$1,125.00 The production of Irish potatoes in Georgia for 1900 was 391,816 bushels, valued at \$301,698. These were raised on 5,762 acres. This is a falling off in acreage and production from 1890, when 431,008 bushels were grown on 5,791 acres.

Tobacco has never been a staple crop of Georgia. Yet it can be grown with great success. Many farmers have cultivated it for their own use, and some have made a good profit by its cultivation and sale. Improved facilities for harvesting, curing and marketing it will greatly increase its production. The type of tobacco depends upon climate and soil. Rich lands give one type of tobacco, while other lands, almost useless for cereal crops, yield a tobacco very valuable for color and flavor. Of course the culture and curing of the plant have great influence on the quality. The plant is first raised in seed beds and when large enough transplanted like cabbage and tomato plants. The land used for the crop must be well plowed and harrowed. Before setting out the plants, the land must be marked three feet or more apart each way, and hills or ridges must be made at the intersection of the marks, and in these intersections the plants are set out as soon as warm weather is assured.

A German farmer in Dodge county who tried tobacco-raising reported that he raised on one-twentieth of an acre 160 pounds of Sumatra leaf tobacco. He was offered \$80.00 for the crop, which would be at the rate of \$1,600 to the acre. In Decatur* county, about eight miles from Bainbridge, is a tobacco farm of 600 acres, which yields the famous Sumatra tobacco of the finest grade.

By the census of 1890 the area devoted to tobacco in Georgia was 800 acres, which produced 263,752 pounds, or 329.69 pounds per acre.

In 1900 Decatur county alone produced more than the whole State of Georgia in 1890.

*See account of tobacco farm in Decatur county in the sketch of that county.

AGRICULTURAL PRODUCTS OF GEORGIA IN 1900.

	Bushels.	Value.
Corn	34,119,530	\$19,448,132
Wheat	5,011,133	4,760,567
Oats	7,010,040	3,434,920
Rye	109,529	112,815
Sweet potatoes		
Irish potatoes	391,816	301,698
Hay	190,237 Tons	2,425,522
Cotton	1,345,699 Bales	48,024,822
By products of cotton		14,000,000
Rice	7,500,000 pounds	375,000
Sugar-cane	No report received.	
Tobacco		
Peanuts		
Apples		
Peaches		

CHAPTER VII.

TRUCK - FARMING.—HORTICULTURE.

TRUCK-FARMING.

Truck-farming has long been one of the industries of Georgia. Before the civil war there were in the neighborhood of our cities and large towns market gardens, where vegetables were raised for sale in the markets and upon the streets, and it is well remembered by many that an important part of the cargoes of vessels sailing from Savannah were early fruits and vegetables for Philadelphia, New York and Boston, which were raised not only near Savannah, but all along the lines of railroad that centered in Georgia's chief seaport. Augusta, even in those days was one of the points from which melons, fruits and vegetables found their way northward, either by rail or by steamer from Charleston and Savannah. Immediately after the close of hostilities between the North and South, there was a great revival of this business, and new men entered into this inviting field. From year to year there was a steady growth, until at the present time, not only in the neighborhood of cities and towns, but near even little railroad stations along all the great lines of transportation that traverse all sections of our State, market gardens have multiplied and trucking has reached those proportions, which entitle it to rank among the leading industries of Georgia. The vicinity of Savannah is still one of the chief centers of the trucking business. The soil is well adapted to the raising of fruits and vegetables, and the climate is so mild that one crop or another can be grown almost every month of the twelve. Major Garland M. Ryals, who moved from Virginia to Savannah soon after the war, has accumulated a fortune in trucking. From one acre he gathers 400 crates of cabbage, selling them at \$1.35 a crate or \$540.00 for the product of one acre. After the cabbages have been gathered, he raises a crop of corn which brings him \$30.00. Then he raises a fall crop of radishes, the sale of which, added to the other amounts, will bring the total income of one acre to about \$700 in one year. Another farmer near Savannah gathered over 500 bushels of cucumbers from a single acre, which sold for a little more than

\$540, bringing him an enormous profit. Another truck farmer sold from one acre \$400 worth of beets, a delicacy much in demand in the northern markets in the early spring. So mild is the season about Savannah, that lettuce can be grown in midwinter with only light covering of leaves or canvas during the cold spells. This product reaches the northern markets when most in demand. English peas constitute one of the most profitable crops. They are ready for the table at Christmas time, and being shipped to the eastern markets bring the highest price. One farmer reports a net profit from two acres of this crop of over \$600.00 in one season. The crop of tomatoes is so planted as to come in just when the northern supply is exhausted, and they always command good prices. One small farmer west of Savannah made \$250.00 net from less than one acre of tomatoes. At Bloomingdale, Meldrim, Guyton, Egypt, Oliver, Haleyondale, Dover and Rocky Ford, along the Central Railway, the lands are specially suited for trucking, and many farmers of that section have abandoned cotton for the more profitable truck crop. Mr. L. C. Oliver of Bloomingdale, gives an estimate of cost and profit by the acre on the Irish potato crop alone. His expense on one acre for fertilizing, seed, planting and working, gathering and freight was \$100.00. An acre produced 60 barrels at \$4.00 a barrel, amounting to \$240.00, or a net profit of \$140.00 to one acre. Fertilizing was the heaviest item of expense; but by this means his land is becoming permanently enriched. All truck farming enriches the land. In this famous trucking section lands can be bought at from three to fifteen dollars an acre, according to location in respect to towns and railways. Of course improved lands sell at a much higher figure.

The value of the trucking business of Chatham county amounts to \$225,000 a year; of Richmond county, \$85,000; of Bibb, \$35,000; of Muscogee, \$30,000; of Fulton, \$150,000.

These are the counties in which are the largest cities, viz.: Savannah, Augusta, Macon, Columbus and Atlanta. Brunswick, the Georgia port of the Southern and Plant systems of railway, is the center of a large trucking business, which in that vicinity has taken a great bound forward. All kinds of vegetables and early fruits do well there. The bottom lands of the rivers of Southeastern Georgia are admirably suited, after drainage, to celery, cabbage, potatoes, strawberries and other products. The sea-islands cannot be surpassed in healthfulness of climate, and with the advantage of the fish and shell-fish, the market gardener near Brunswick cannot fail to live well and prosper. With some vegetables as many as three crops can be raised on the same ground in one year. The value of the trucking business in the vicinity of Brunswick is \$50,000 a year.

Besides the more important centers already named are numerous towns and stations along all the railway lines of Georgia. Some of the counties with a large trucking business are: Houston and Burke, the product of whose market gardens is \$15,000 a year for each; Spalding county, with a product of \$16,000, and Macon county, with a product of \$12,000. While Eastern Georgia supplies the markets of the North and East, Middle and Northwest Georgia should supply Louisville, Cincinnati, Chicago and the northwest with early vegetables.

Men of intelligence and thrift here and there throughout Georgia have shown the great capacity of our soil for high cultivation. What has been done by some can be done by all with the same good skill and management.

Georgia is so famous for melons that this subject should not be closed without reference to them. The Georgia watermelon stands unrivaled, both in quality and quantity, and enjoys a national reputation. So extensive is its cultivation and so large its shipment and sales, that it ranks as one of the money crops of the State. One hundred thousand acres are devoted to its culture, and more than 10,000 cars are required to carry this fruit to market. As many as 316,000 melons have been sold in or shipped from Augusta alone in a single season.

Thousands of melons are consumed on the farms and in the cities and towns of the State, vast numbers of which were carried to their various markets in wagons and carts. So the shipments by rail or steamer do not give a complete idea of the great numbers sold and consumed. Georgia cantaloupes, too, get to the northern markets first, and like all other early fruits command the first and highest prices.

We close this section on truck-farming with one more example of the success which attends well-directed management. Mr. F. J. Merriam, who runs a hill-side farm near Atlanta, says that in 1893 he broke ground to meet the market demands in Atlanta. Though he only made \$500.00 the first year, the receipt of \$115.00 from 250 hills of cucumbers convinced him that he was on the right track. The next year his sales went to a little above \$1,900, and from one acre of potatoes he received \$500. The receipts from his land continued to increase and the fourth year his receipts were \$5,068, of which \$764.00 came from lettuce, \$583.00 from turnip salad, and \$404.00 from beets. In 1899, notwithstanding the very bad season in the spring months, he had sold up to the 1st of August \$4,138.55 worth, \$600.00 of which came from one acre planted in cabbage. He estimated that he would, by the close of the year, receive a round \$10,000 from his little farm.

To the careful, intensive farmer, the land yields rich returns. Many farm lands with just as good soil as those that have been cited as examples, yet unimproved, can be bought on very reasonable terms.

HORTICULTURE.

In the product of her orchards, Georgia stands in the front rank. It has long been known that her soil was well adapted to the raising of certain kinds of fruit. But of recent years it has been shown through the labors of the Georgia State Horticultural Society, that Georgia soil has a capacity for the production of a great variety of fruits, especially of apples, apricots, cherries, peaches, pears, plums, prunes, grapes and strawberries. In the extreme southern section of the State we can add to this list oranges, pineapples and bananas.

Peaches.—But the queen of all these fruits in Georgia is the peach, and our State has as great a reputation for peaches as Florida has for oranges. Her acreage in peaches has much more than doubled since 1890, and the capital invested in orchards of this delicious fruit has greatly increased. From counties of the northern to those of the southern section the development has been rapid. There is in all America no peach of superior flavor to that of Georgia.

The land seems specially adapted to their production, and in this climate the crop can be marketed so early that it commands the highest prices. With the great improvement in the transportation service and the fine reputation of the Georgia peach the steady growth of this business is well assured. The country lying south of Macon is the best fruit-growing country in the world. The fruit-grower ships his fruit to the best market at express speed. South Georgia fruit being the first to reach the market has the advantage of the first prices, which are, as before said, the highest. Some of the results of peach-growing in this section seem almost fabulous. A few years ago Messrs. N. Dietzen and brother, near Fort Valley, cleared \$24,000 from a 200-acre orchard, the net profit being \$120.00 to the acre. Mr. Ed. M. McKenzie, of Montezuma, by his first year's shipment, cleared \$2,000 above all expenses from fifty acres of peach-trees. Mr. J. D. Howard, of Lorane, Ga., from a five-acre orchard of three-year-old trees realized \$1,200. Mr. S. M. Mashburn of Barnesville, from thirty acres, sold \$4,000 worth of fruit. This was a net profit of \$133.00 to the acre. Mr. S. H. Rumph, of Marshallville, is probably the largest fruit-grower in the South. He was the first to produce the famous Elberta peach. He has more than 160,000 bearing trees, and one orchard of Abundance plums of 20,000 trees. He

is also largely engaged in the nursery business, from which alone his annual sales run as high as \$70,000. Edgewood Farm, the property of the Hale Georgia Orchard Company, at Fort Valley, covers 1,000 acres of the best fruit and nursery lands of the South, and is situated on a tableland, 600 feet above the level of the sea. There are in the orchard 200,000 trees in full bearing from May to August. Four hundred hands are employed in these orchards. Every extensive peach-grower should own and know how to operate a canning factory, as this would guarantee the saving of his entire crop in any kind of weather. The two canning factories of Eatonton offset in 1900 by canning a great deal of what had been lost to Putnam county through the shipment of fruit which had been so affected by the wet spells in June, that it reached the market in an unsalable condition. During the peach season the canning factories of Fort Valley are kept busy putting up thousands of the best peaches, which are too ripe to bear shipment, and notwithstanding, are in fine condition for immediate use. The steam evaporator for drying the peaches has also been the means of saving much excellent fruit that otherwise could not have been utilized.

In the neighborhood of Eastman a new peach region is rapidly developing. At Tifton, the junction of the Plant System of railways, and the Georgia Southern and Florida Railroad, are large orchards producing the best varieties of peaches. This section is less liable to the effects of late frosts, as is shown by the fact that in 1894 and again in 1899, when peaches in other parts of the State were a total failure by reason of late frosts in the spring, a considerable quantity was shipped from Tifton and other points near by. Cobb county in the northwestern part of the State, on the extreme northern border of the Middle Georgia belt, is among the leading peach-growing counties. The number of peaches shipped from Marietta, the county seat, was much larger during the summer of 1900 than in any previous year, because so many new orchards were beginning to add their product. The largest shipper for the season of 1900, Mr. W. R. Turner, shipped from his large packing house more than 20,000 crates. The principal crop of the county is the luscious Elberta. Mr. W. M. McKenzie, from his own orchard at the foot of Kennesaw Mountain and those of Mr. J. G. Morris and United States Senator Clay, shipped over 12,000 crates of some of the finest fruit, both in size and color, that went from Marietta in the summer of 1900. The orchards of Judge George F. Gober in Cobb and adjoining counties of Cherokee and Pickens, consist of 300,000 trees, most of which were too young to bear in 1900. Of these more than 100,000 are in Cobb county, 75,000 in Cherokee and 125,000 in Pickens.

Mr. G. A. Moore has an orchard of 60,000 trees, most of which are yet young. These details about Cobb county give some idea of how the fruit industry is growing all over Georgia. The vicinity of Rome, close up to the mountain region, and Dalton, among the mountains, is coming into notice for orchards which produce the very best of peaches, and in all the region between Dalton and Dallas new orchards are adding their products to swell Georgia's prosperity. Marietta, Austell, Rome, Summer-ville, Adairsville, McHenry, Plainville, Calhoun and Dalton are coming to the front among the great shipping points for Georgia fruits. The bulk of the crop from this section gets into the northern market after the rush from Middle and Southwest Georgia and before the Delaware crop. The beauty and flavor of the fruit commands the highest prices.

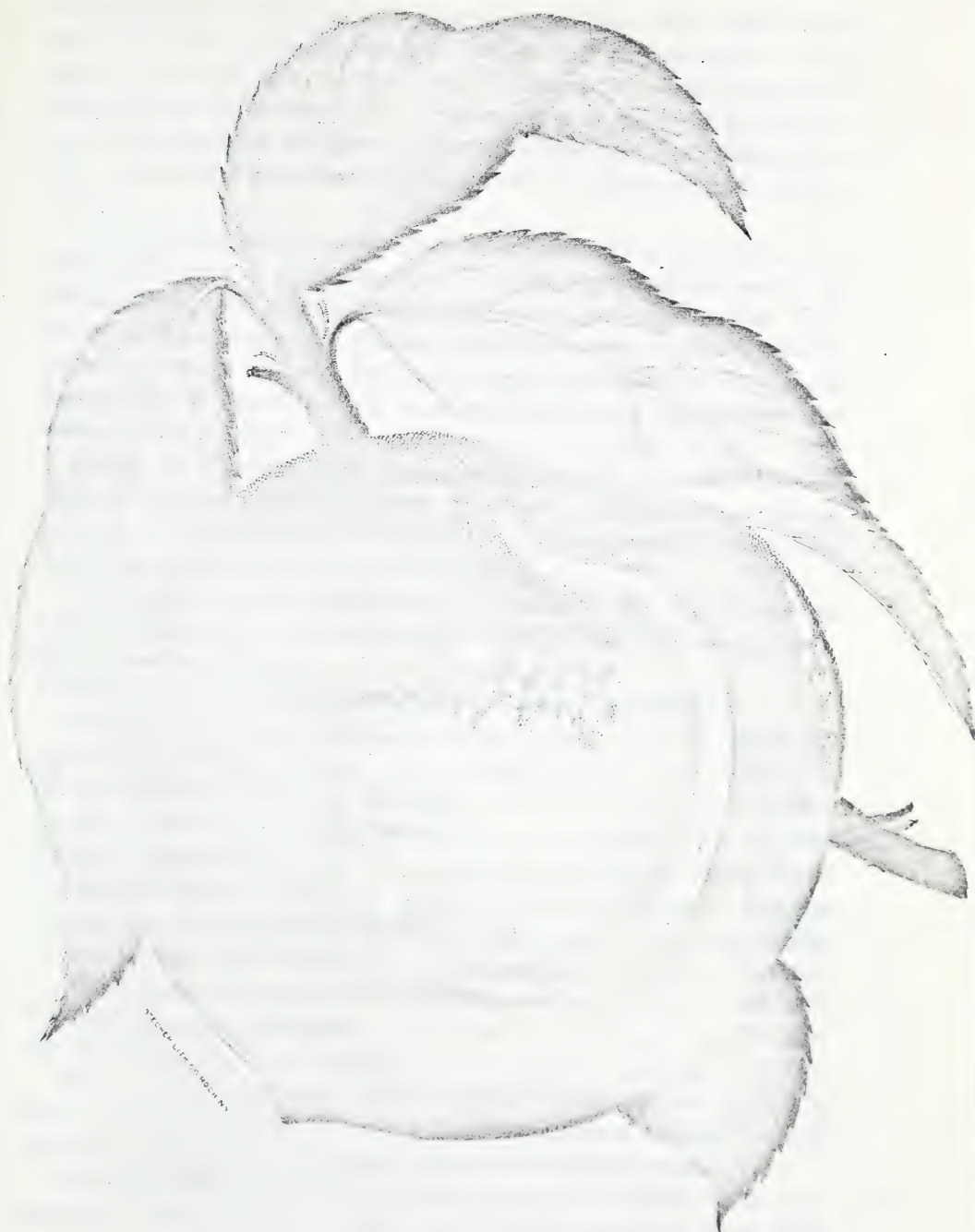
Nor should we forget Cornelia, located upon a ridge of North Georgia hills, 1,600 feet above sea level, and commanding a splendid view of the far-reaching Blue Ridge. This is the trading point for quite an extensive farm neighborhood, and only eighteen miles distant from Nacoochee valley. Here in the mountains some of the most successful orchards of the State are located, which have escaped injury from frosts, even when the peach crops of other sections have been damaged. The great success attending the efforts of peach-growers here has led to the beginning of new orchards.

In addition to the commercial orchards, almost every farm in North and Middle Georgia, large or small, has its orchards of peach, apple, pear, plum and cherry trees, its patches of watermelons and cantaloupes, its strawberry beds, dewberries and blackberries in abundance; and some of them have also their raspberry bushes.

Mr. J. H. Hale of Connecticut, who was in charge of the Horticultural Department of the eleventh census, in a speech at Minneapolis at a meeting of the American Association of Nurserymen, said, concerning the great peach section of Georgia: "It is a magnificent soil, easy to work, and the peach-trees going down into that red clay, it does produce fine colored peaches, and they look better and taste better than those of California."

The *Boston Herald* in an editorial pronounced the Georgia peach superior to that of California and to all others. The *Chicago Record* said: "The fanciest peach that comes to Chicago is the Georgia Elberta, . . . richer than a bowl of fresh cream."

The *New York Tribune* said: "They are larger than the peaches produced for this market on the Delaware peninsula and in New Jersey, and by universal consent much more delicious than the northern fruit." In



ELBERTA PEACH.

One of the largest and most esteemed of all yellow fleshed peaches ; tree vigorous and productive ; a valuable acquisition.

an editorial on "A Nation's Debt to Georgia," the *New York World* said: "The more northern States of this country have long had a deep sense of their obligation to the State of Georgia for its devotion to the cultivation of the watermelon. This debt is now increased by the success of the Georgia peach crop, which has this year been sufficient to drive out of the Eastern market the beautiful but tasteless peach of California."

The following is an extract from an article which appeared in the *Chicago Tribune* of Thursday, March 7, 1901, regarding the peach crop of the country: "While the bulk of the Georgia yield goes to New York and other eastern markets, Chicago is favored annually with a steadily increasing percentage, and fruit men agree in pronouncing the Georgia peach as by all means the best in point of size, flavor and firmness that comes to this market."

During the season of 1900 the number of car-loads of peaches from all Georgia shipping points was 2,500, of which 1,400 were from stations along the Central Railway, along the various lines of which road about 2,100,000 trees were at that time in bearing.

According to figures furnished by Professor W. M. Scott, the State entomologist, there are this year (1901) 5,253,000 bearing peach-trees located as follows:

On the Central of Georgia, including the former Chattanooga,

Rome and Southern	3,473,000
On the Plant System	300,000
On the Georgia Southern and Florida	200,000
On the Macon, Dublin and Savannah	200,000
On the Georgia Road	150,000
On the Seaboard Air Line	150,000
On the lines of the Southern Railway	1,250,000
On the Western and Atlantic	200,000
On the Atlanta, Knoxville and Northern	180,000
On the Chattanooga Southern	100,000
On the Wrightsville and Tennille	50,000

If the bearing trees away from the railroads be counted the number in Georgia will reach 6,000,000. At a moderate estimate there will be sold from these trees 4,000,000 crates of peaches at a dollar a crate.

Last fall (1900), 2,000,000 new trees were set out, which, with those put out in 1899, will give Georgia over 8,500,000 bearing trees in 1903.

Thus it is seen that the peach industry in Georgia is rapidly growing in importance.

Apples.—The next largest fruit crop of Georgia is that of apples.

These have been grown successfully in all sections of Georgia. Those raised in the northern part of the State are particularly fine. Large shipments are made from Rome, Marietta, Cartersville and Dalton. This section for early apples has the markets of the North and West. For later apples it has the holiday and winter trade in all the cities of the South, especially in the gulf region, where the best varieties cannot be successfully grown. The charming city of Rome, so romantically situated on picturesque hills sloping to the water's edge, at the point where the Etowah and Oostanaula join their streams to form the beautiful Coosa, is the chief market for the receipt and shipment of apples for a large fruit-growing section. We have no apple that will grow in South Georgia of such size and flavor as to come in competition with the apples of the North, but may we not develop one? If, when Europe had no beet that would make sugar in paying quantities, scientific agriculture could develop one, may not our horticulturists do the same for the Georgia apple?

Judge Gober, who owns so many fine peach orchards in Northwest Georgia, has also 3,000 apple trees, bearing fruit of excellent flavor, and there are many thousands of apple trees all through North and Middle Georgia.

Pears.—This fruit, too, receives considerable attention from the orchard men of Georgia. Thirty-five varieties are mentioned with approval by the Georgia State Horticultural Society. In Houston, the banner peach county of Georgia, over 10,000 pear-trees are owned by Ohio companies. There are also numbers of small orchards of from 1,000 to 5,000 trees. These net their owners anywhere from \$500.00 to \$10,000 dollars a year. There is said to be a strip of land near Marshallville where the fruit crop never fails. Near this town there is a mile of pear-trees flanking the cotton fields. Here can be seen fruit and cotton ripening side by side. One of the most noted points near Fort Valley is the Pear Drive with its double row of trees lining the road, a favorite resort for Houston's belles and beaux.

Plums.—There are also in Georgia many varieties of plums. Many grow wild, but considerable attention is given now to the culture of the better kinds. In the two great peach counties of Houston and Macon, the number of plum-trees exceeds that of pear-trees by several thousand. Near Marshallville is a magnificent orchard, partly of pears and partly of plums.

One of the prettiest views of the fruit lands of Georgia is the plum orchard of James Beatty of Spalding county. The whole country around Griffin is full of peaches, plums and grapes. On the line of the Central

Railroad are 200,000 plum trees bearing finer plums than those of California.

Grapes.—Georgia is rapidly coming to the front as a grape-growing State. The average in vineyards has greatly increased of late years, and their output has attracted the attention of the whole country. The eleventh census reported that Georgia produced 107,666 gallons of wine and 3,876,000 pounds of table grapes. "The latter ripen early," said the census report, "reaching the northern markets a month earlier than those grown in Ohio or New York, and consequently bring much higher prices than the northern and western grapes." The report added that the Niagara variety, a white grape, was hardy and ripened early, and for these reasons was meeting with great success in the Southern States, but that the acme of perfection was the Delaware. Grape culture is not confined to any one section of Georgia. At Cornelia, in Habersham county, a number of Swiss families settled a few years ago, planted vineyards and are now turning out wines of the finest quality and in great quantity. In the vicinity of Tallapoosa, in Haralson county, is a large grape and wine district, where hundreds of acres of vine-covered trellis stretch before the eye. In Floyd county, Northwestern Georgia, much attention is also paid to grapes. In Middle Georgia the yield of this fruit is very great. Near Tennille, in Washington county, there is a large vineyard flanked by an orchard of LeConte pears. One can easily surmise whence Vineyard in Spalding county gets its name. All along the lines of the railway between Atlanta and Macon a traveler sees stretches of vines laden in their proper season with luscious fruit. At Visscher's vineyard, a sunny, fertile spot in Houston county, not far from Fort Valley, all the well-know varieties are found. Large quantities of grapes are shipped each year from the prolific vineyards of this neighborhood. The raising, boxing and shipment of grapes through the various belts of Georgia promise to be as remunerative in the near future as is peach-growing now. About thirty miles from Atlanta, in Coweta county, at Vina Vista, is a large vineyard and winery. Here grapes of every variety and domestic wines of the best quality are produced. To give some idea of what has been done in Georgia we give a few statistics of crops and sales of the fruit of the vine.

J. F. Wilson of Poulan, Georgia, made from 23,415 pounds of grapes 1,361 gallons of wine, which he sold for \$1.50 a gallon, or \$1,941.50 for his wine. He also marketed 12,593 pounds of grapes. This makes a total of 36,008 pounds raised on eight acres of land, or 2 $\frac{1}{4}$ tons to the acre in the first bearing year. Mr. O. A. Dunson of LaGrange, Georgia, from a vineyard of about 25 acres of four-year-old vines, 600 to the

acre, gathered 30 pounds of grapes to the vine, or 18,000 pounds to the acre, equal to nine tons. The usual estimate is three tons to the acre.

Mr. J. C. Gerioux, of Tallapoosa, has a Worden vine which, in its fourth year, yielded by actual count 232 bunches, with an aggregate weight of 75 pounds. In 1895 he sold his grapes at seven cents a pound, and has never sold them for less than five cents a pound. Mr. George M. Williams, of the same town, planted one acre which had formerly been a baseball ground, setting out one-year-old roots. Two years later his 700 bearing vines bore 8,500 pounds of fruit, which, if sold as low as two cents a pound, would bring \$170.00 as the money product of that one acre. Nor should we forget Judge Gober, a noted fruit king of Northwest Georgia, who owns 15,000 grape vines of sixty varieties.

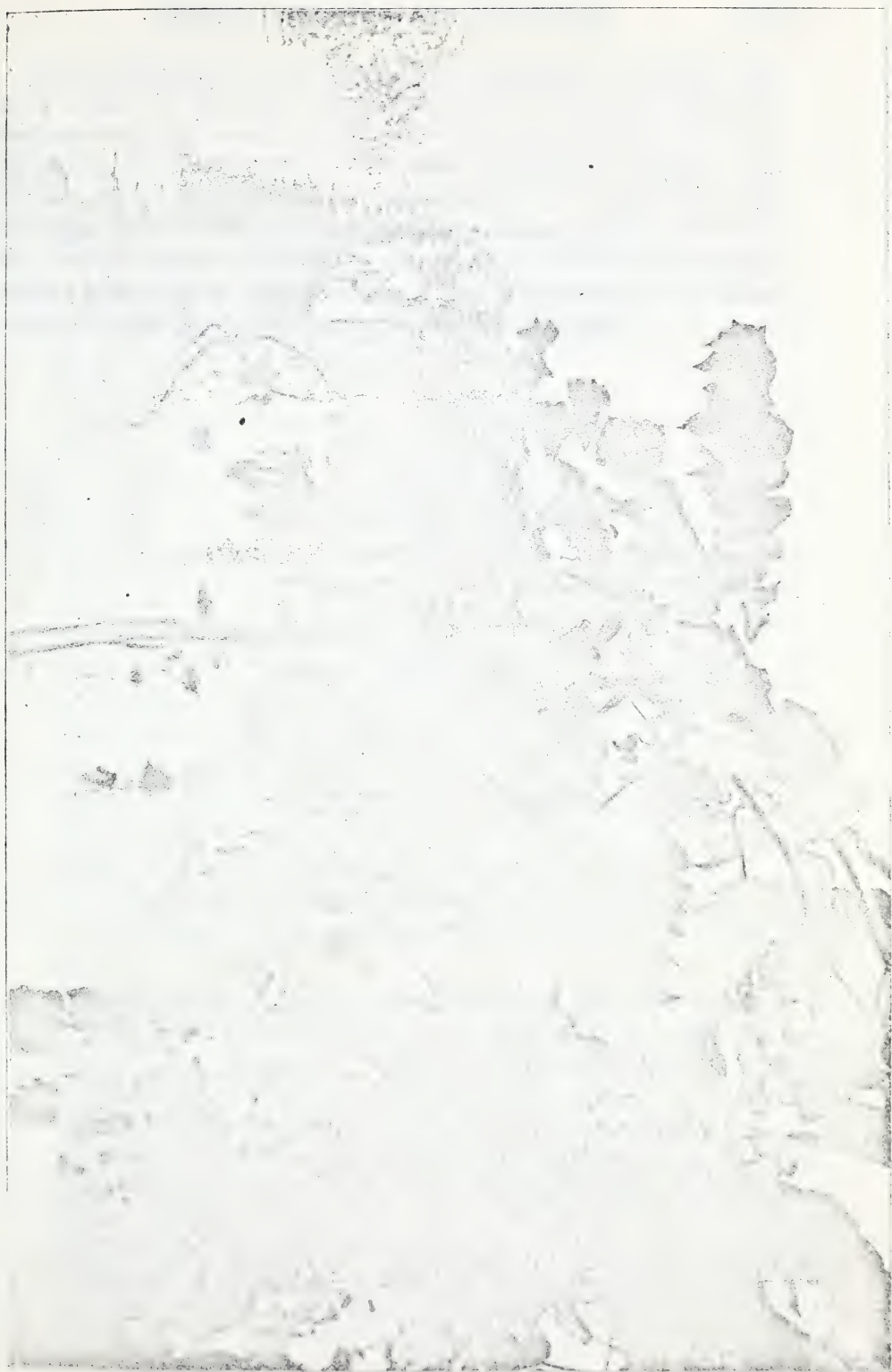
Other Fruits.—Many other fruits thrive well and make abundant yields. Excellent cherries are produced in Northern and Middle Georgia. Figs and pomegranates grow admirably in Middle and Southern Georgia, needing no protection in winter, except in the upper part of the middle belt. The olive succeeds well on the coast. In the southeast Ogeechee limes are gathered in considerable numbers for preserving. Quinces are raised for the same purpose in Middle and Northern Georgia. Oranges, pine-apples, lemons and bananas are successfully grown in the southern and coast tiers of counties.

A *pecan grove* of 1,000 trees now in bearing, is located in Dougherty county. Several small groves are located in Mitchell county in addition to which 100 acres were planted last year in that county. The Tifton section is well suited to pecan culture, and already several small groves are in bearing. Nor is this industry confined to South Georgia; bearing groves are located in Spalding and Hancock counties, and young trees are in great demand for planting in North Georgia as well as further south. Richmond county also has a few pecan-trees, which bear nuts of fine quality.

Berries.—Georgia raises abundant crops of strawberries, for home consumption and the northern markets. They reach New York and Boston in the interval between the berries of Florida and those of the Middle and New England States. Blackberries are abundant, both wild and cultivated. Raspberries with proper attention make good yields.

Georgia has many advantages over California. It requires only two or three days to transport fruit from this State to New York at a cost of about \$208.00 a car, while it takes nine days from California at a cost of \$360.00 a car. Besides, Georgia fruit being so much nearer to the eastern markets, can be picked at a much more advanced stage of maturity than the fruit of California.

AN ORDINARY SIGHT IN A GEORGIA VINEYARD.



The eleventh census of the United States showed that no farmer could make as much in any other agricultural pursuit as in truck raising and fruit-growing, the average profit from which was \$150.00 to the acre. In making out this average the South stood the highest, which fact was due not only to its great productiveness, but also to its cheap labor, and the higher prices which result from the early seasons. Common laborers can be hired at sixty to seventy-five cents a day of twelve working hours, while a better class of laborers command from eighty cents to one dollar a day. The laborers provide their own board and lodging.

CHAPTER VIII.

DAIRYING AND CREAMERIES.

Among the new industries that are claiming more and more the attention of our people is that of dairying. Within the last decade encouraging progress has been made and quite a number of dairy farms and creameries have been established. Much interest in the subject has been aroused by the Georgia Dairymen's Association, which, in its report at the sixth annual meeting, showed a membership of more than one hundred and seventy. Of course no one will embark in any industry unless convinced that it will pay. It can be easily demonstrated that Georgia is in every respect well adapted to this business. First, climate is all that can be desired. Even during the hottest summer months, July and August, the thermometer rarely goes above ninety degrees, though it does sometimes go as high as ninety-five degrees, and at long intervals, say once in five or six years, may reach one hundred degrees. In winter it rarely falls as low as fifteen degrees above zero, although it has occasionally fallen as low as eight degrees above, and once in about fifteen or twenty years has been known to go to zero. Snow is of very rare occurrence, Middle and Southern Georgia being sometimes for several years in succession entirely free of it. The dairyman is not compelled to incur the expense of housing his cattle for months; for he needs only such simple shelter as will afford them protection for a few weeks. This is itself a very important consideration, as dairymen of the North and West well know.

In the section on grasses and forage crops we have already shown the capacity of Georgia soil to produce the most nutritious forage and pasturage at the lowest cost. Not only are the so-called foreign grasses successfully grown on Georgia soil, but the State is rich in its possession of the hardy Bermuda, equal to the Timothy of the northwest. Even the poorest soil is easily set with Bermuda, while an improved soil will produce it so abundantly that it can be mown two or three times during a season. By sowing on the Bermuda sod in October several winter and spring-growing plants, such as red, burr or crimson clover, hairy and common vetch, either alone, or with each other, or with oats and rye, one may secure good winter and spring pasturage until April.

The cow-pea, besides being a great soil-restorer, is also the best hay and ensilage crop of Georgia. In ninety days from sowing on wheat, or other small grain stubble, it will make a full crop of vines. It will grow on any sort of soil, although of course the better soils make the better yield. Wheat sown November 1st can be harvested by June 1st. Any time from then until July 1st will do to sow the cow-pea, which is harvested in September. It will make more hay in ninety days, if sown after wheat or oats, than red clover will in a year. It is the salvation of our lands and the delight of the milch-cow. Others of our native grasses are rescue or arctice grass, crab-grass and crow-foot grass, which afford pastures new and ample, and with the addition of the various clovers, barley, rye, oats, sorghum-cane and corn forage give a great variety of food for cattle. Our cotton seed, after the oil has been pressed out, furnish the cakes, considered among the best of foods for cattle, as well as the cheapest. A good milch-cow can be fed at a cost of seven cents a day on cotton seed-meal cakes, cotton seed-hulls and a little wheat bran. Corn ensilage, whose succulence and beneficial effects make it doubly valuable, is claimed by some to be the cheapest of all foods for cattle. All the food necessary for stock can be grown right here cheaper than at the North. There is the greatest abundance of pure water supplied by clear running streams. In healthfulness no land is more desirable. Our markets are numerous and excellent. Atlanta, Augusta, Macon, Columbus, Savannah and Brunswick, our large cities, as well as a great number of large and flourishing towns, all thriving and steadily growing in population and wealth, are heavy importers of butter and cheese, most of which they obtain from the States of the North and West and even from Canada. Gladly would they use the product of our own farms.

The sweetmilk, buttermilk, cream and butter from the dairy farms find a ready sale in all the cities and towns of Georgia. The butter, which by most people, is preferred to the best imported article, falls far short of supplying the demand. Good creameries, well located, are a great help to the dairy farms. Creameries in Georgia pay about one half more for milk than is paid in the North, and the home market for butter and buttermilk insures them a good profit. At our creameries whole milk is worth \$1.25 a hundredweight, and butter-fat brings twenty cents a pound, which is equivalent to fourteen cents a gallon for milk, a much better price than can be obtained North and West. A fully up-to-date creamery is located at Griffin, between Macon and Atlanta. There is also one at LaGrange, in Troup county, and another at Sparta in Hancock county.

Another is to be located between Macon and Savannah. Thus dairy-

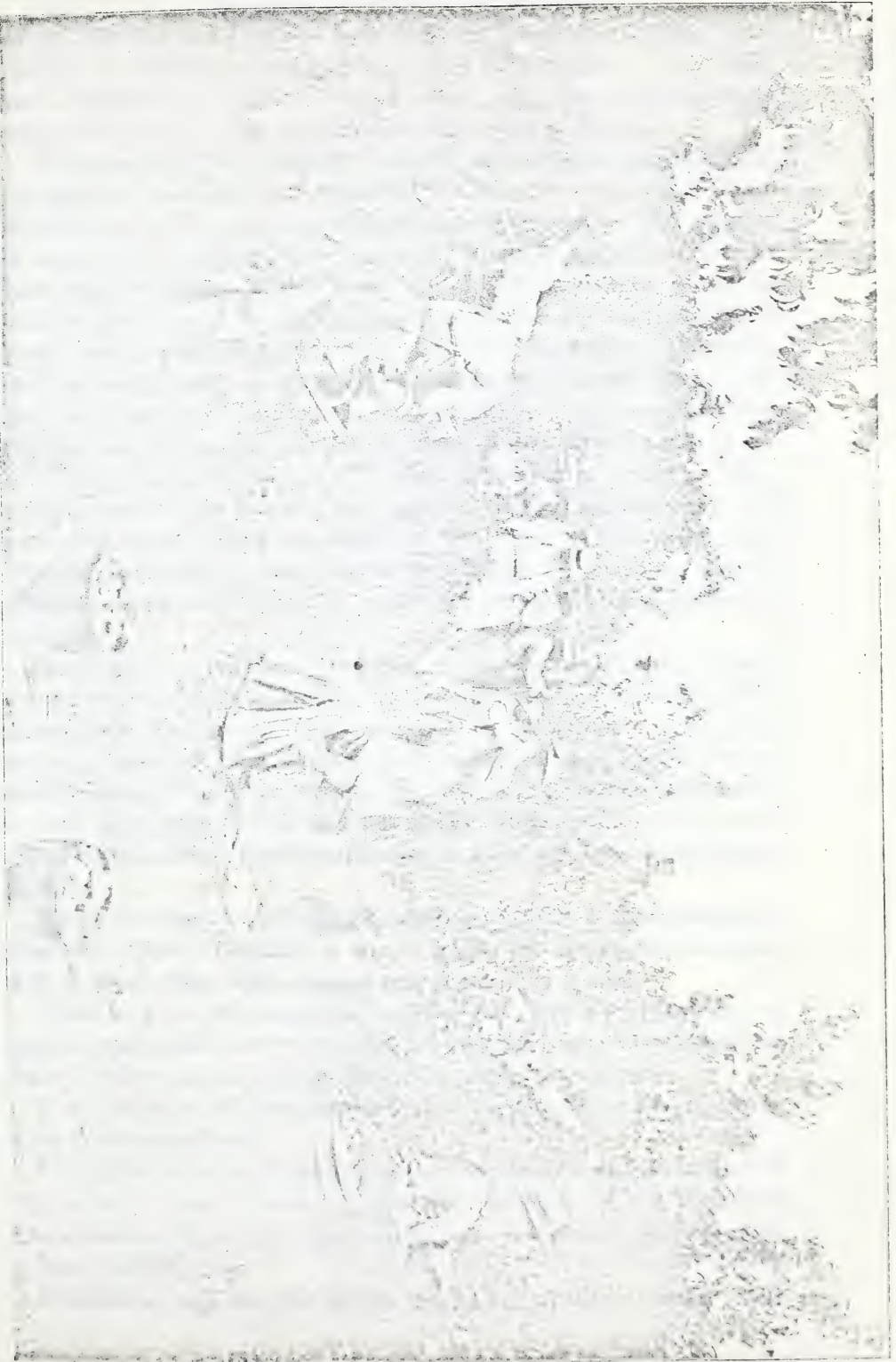
men in a large section of country will enjoy creamery advantages, and this will add much to the profits of their farms. The adaptation of the ice machine to creamery purposes has given to dairying in Georgia advantages unsurpassed in any section of the Union. Creamery men know the disadvantages attending this industry in new territory in the North. Here the difficulties are lessened in many respects. A good market for buttermilk, butter, etc., enables a creamery to start with a small supply of milk. The profit to the dairymen soon builds up a sentiment favorable to the creamery.

Lumber for siloes, barns or other outbuildings will cost from \$7.00 to \$9.00 a thousand, and dressed lumber from \$10.00 to \$14.00. Land can be bought in Middle Georgia at from \$4.00 to \$15.00 to the acre, and can be had on reasonable terms as to time. The rate of interest is 8%. Land fully stocked can be rented on about the same terms as at the North. Most of the lands that are for sale are under cultivation and have more or less of the necessary buildings upon them.

The creamery industry, like that of the dairy farm, has now passed the experimental stage in Georgia. The satisfactory results and handsome profits realized by those who have experimented on these lines, prove the correctness of the opinion of Prof. H. J. Wing, of the Georgia Experiment Station, that in comparing Georgia with many other sections for the production of milk, butter and cheese, the "Empire State of the South has nothing to fear."

Mr. R. J. Redding, director of the Georgia Experiment Station, says: "I know of no soils that respond so promptly and gracefully to fertilizers and manure as the soils of Georgia. During each of the last three years yields of twenty-five to forty bushels of wheat to the acre have not been unusual. The same soils would produce 75 to 100 bushels of oats, or $1\frac{1}{2}$ bales of cotton, or 50 bushels of corn. . . . The common crab-grass, the inveterate foe of the old-time Georgia cotton farmer, would be considered a very great boon in any northern State, if it would spring up in the corn fields and small grain fields after harvesting and produce 1 to $1\frac{1}{2}$ tons of good hay (much better than Timothy), as it will do in any good soil in Georgia, without any expense except the harvesting. . . . Cottonseed-meal and hulls afford an unfailing resource for feeding and fattening, being especially and admirably adapted to beef-cattle.

Mr John Wallace of Griffin, Georgia, to whose "Conclusions of a Northern Creameryman" we are indebted for some excellent points, declares: "I have been extensively engaged in dairying in the North, especially in Northwest Iowa, where I operated several creameries and



PEACH PICKERS.

cheese factories, and have now been operating a creamery in Georgia for the last six months, and am highly gratified with results. . . . Cheap lands, climatic conditions, variety of grasses, etc., offer inducements to young dairymen that can be found nowhere in the northwest."

Of course, after the questions of climate, soil, healthfulness, and food for man and beast have been considered, the selection of the proper breed of cattle for the dairy farm is of the highest importance. The question is what kind of cattle will pay best, and how much attention should be bestowed upon them. If milk is the object of the proprietor, special attention should be given to providing suitable and abundant food, and proper care should be bestowed upon the cattle themselves. Of course, each individual must make his own choice of breed to suit his soil, climate and pasturage. At present in Georgia the Jerseys are the most popular and fashionable. Mrs. B. W. Hunt of Eatonton, the wife of one of the most successful farmers of Putnam county, in an article on "Bermuda grass and the Jersey Cow," gives a decided preference to this particular breed, which she considers the queen of the milch-cows. Though the scepter of the Jersey is disputed by the Guernsey and the Holstein, she is undoubtedly the preference among the dairy farmers of Georgia.

Skim-milk is a valuable by-product of the dairy, and many experiments have been made in feeding it to pigs and calves at the dairy. These experiments have shown that skim-milk in combination with grain makes an excellent food for hogs at all periods of their growth, but especially during the earlier periods. Not only does this combination make a much more economic ration for hogs than either milk alone or grain alone, but also causes the animals so fed to make much more rapid gains in flesh.

When the proportion of these two articles of diet is three pounds or somewhat less of skim-milk to one of grain, the return for the skim-milk is greater than when a larger proportion of it is used.

When hogs are fed on milk alone they gain very slowly and do not keep in good health, and young pigs fed on grain alone do not thrive as those to whom milk and grain are fed in proper proportion.

If fed on either of these materials alone they do better pastured than when kept in small pens.

Young calves up to 3½ months of age require less of both milk and dry matter to make a pound of gain than do hogs. When they have reached five or six months, they require more dry matter, half of which at least should be hay.

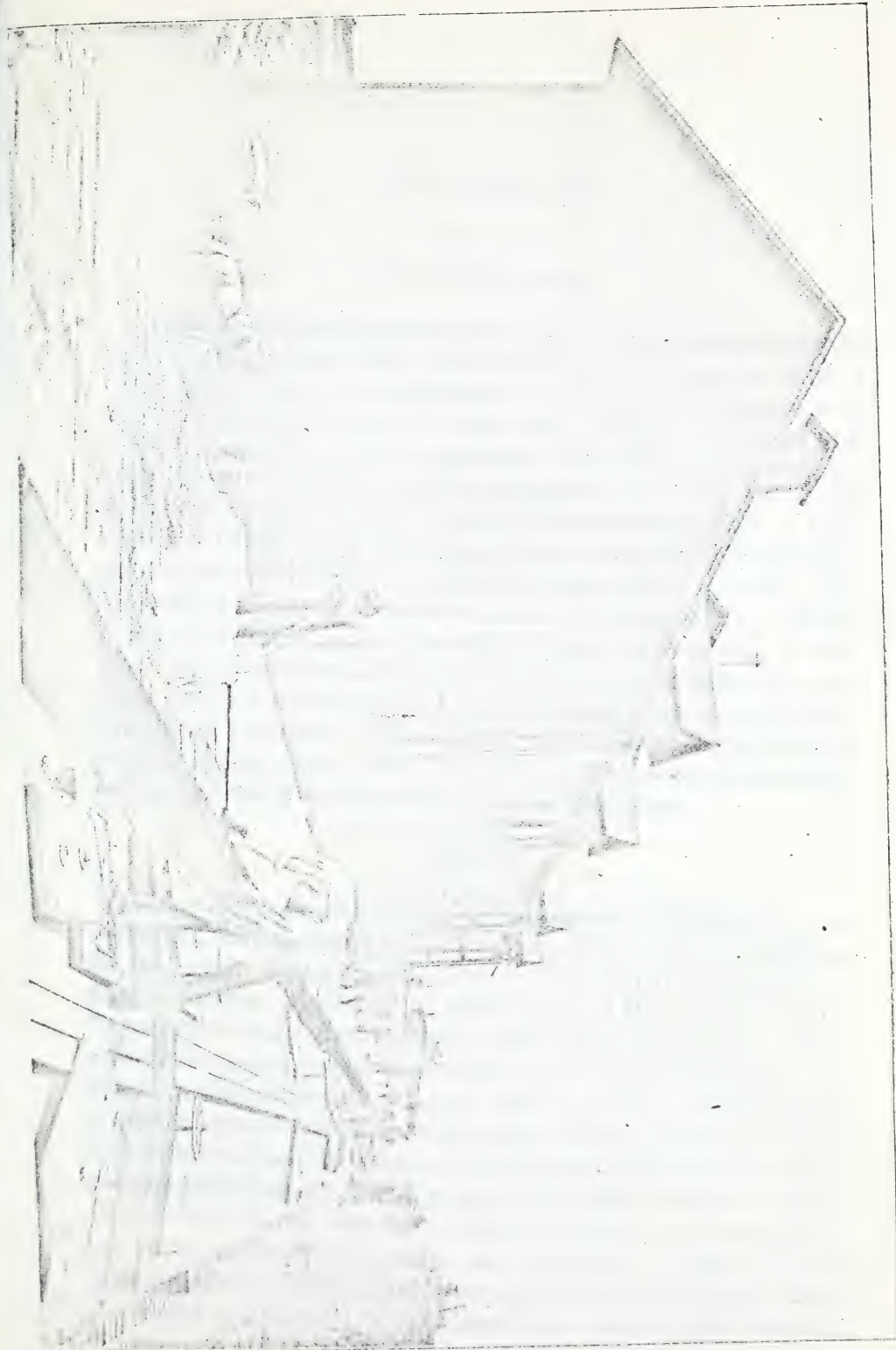
Considering only the gain in live weight and quality of meat, whole

milk is the best food for calves, but is too expensive a ration, and they may be very profitably fed on skim-milk when properly used.

Calves whose rations are composed larkely of skim milk gain one half of a pound less in a day than those fed on whole milk, but require practically the same amount of dry matter for every pound of gain.

When fed to calves, fully as large financial returns are obtained for the skim-milk as when fed to hogs.

At creameries or cheese factories, it pays to feed their by-products near these establishments. The proceeds from them can be divided among the patrons according to the milk supplied by each, in the same way as the butter and cheese made are divided. Under the very best conditions it costs five hours of labor, or fifty cents, to look after 500 hogs for one day. This is \$50.00 for caring for 500 hogs for 100 days, or ten cents for one hog for a hundred days, or for a gain of 100 pounds, which gives one-tenth of a cent as the labor cost of producing one pound of live weight of hog. If the value of the gain was reckoned at four cents a pound, the labor cost of producing the pork was only $2\frac{1}{4}$ per cent. of its selling price. It is evident that when hogs are handled in large numbers, as they may be at a creamery, the labor of growing them is a very small item. These remarks on the labor-cost of feeding animals are just as applicable to the feeding of calves as of hogs, though it would be more difficult to feed a large number of the former than of the latter. On the farm the expense of feeding these animals would be greater than at the creamery. The value of whey for feeding is generally estimated at one half that of skim-milk.



CHAPTER IX.

STOCK-RAISING.

So soon as our farmers began to diversify their agricultural industries and no longer to give their whole attention to the raising of cotton, a demand was created for improvement in the breeds of cattle, and more care than ever before was given to the raising of stock. Of course, even under the old system every enterprising farmer was careful to secure a full supply of good live stock for his plantation, and it was no unusual thing to see pastures on which were grazing fine-looking cattle, or flocks of sheep. Glossy-coated, well-groomed horses, champed in the stalls the ripened grain or fed upon the nourishing grasses of the meadows. The well-ordered plantation of the olden time was well-stocked also with fine mules and well-fed hogs, and abundantly supplied with poultry of every kind. But there were many farmers who did well with corn and cotton, whose stock was of such inferior sort, as to convey an idea of thriftlessness and lack of enterprise. Of late years, with the great improvement in methods of cultivation, have come advanced ideas on the breeding, rearing and care of all kinds of stock needed on the farm.

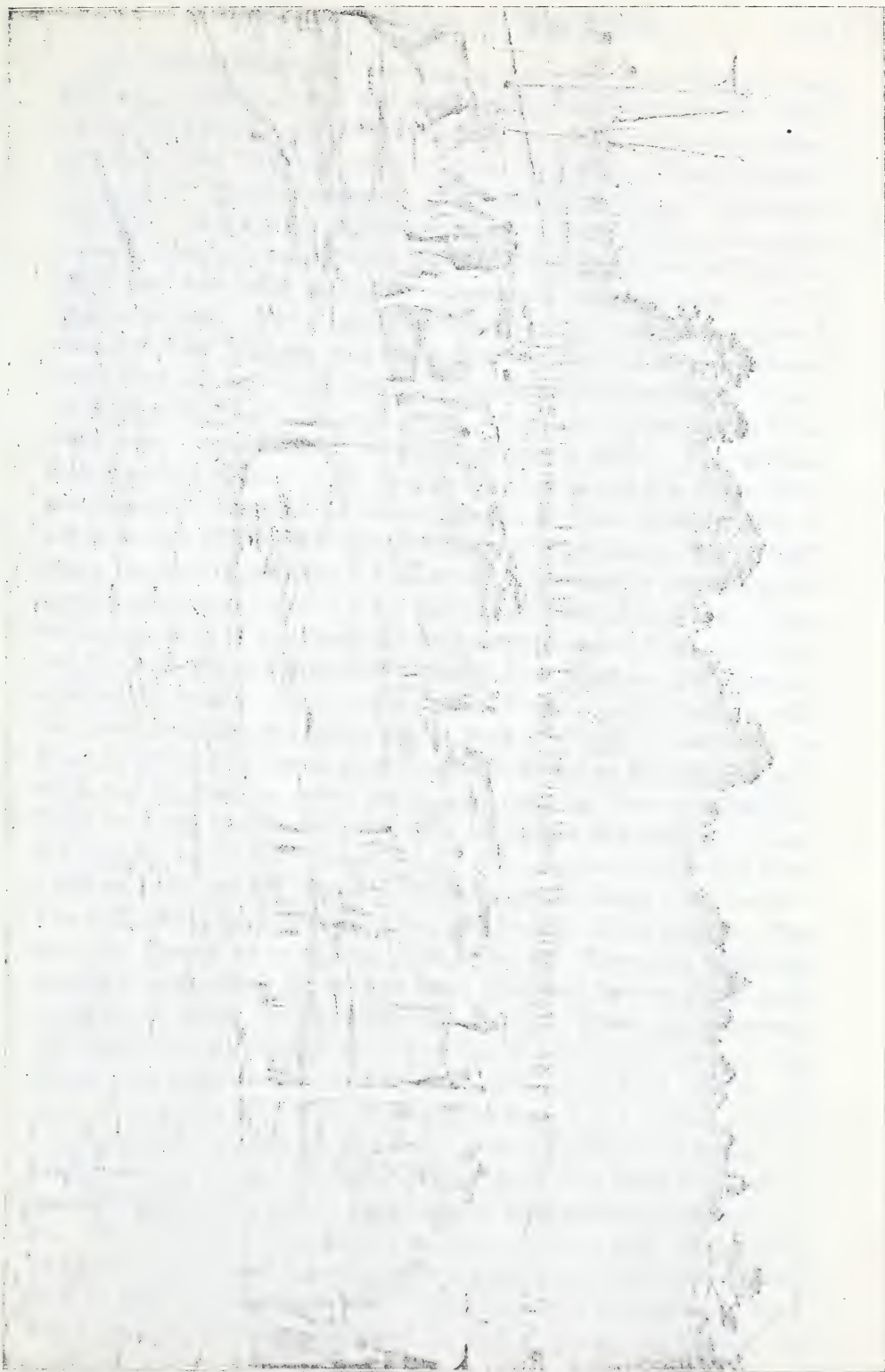
CATTLE.

Cattle.—The industries of dairying and creameries comparatively new in Georgia, have had much to do with the preference shown in this State for the Jersey. Indeed the high favor in which they are held is not confined to Georgia. Mr. Henry E. Alvord, chief of Dairy Division of the Bureau of Animal Industry, United States Department of Agriculture, says: "Jerseys have been so numerous imported, have increased so rapidly in America, have been so largely used for grading, and have proved so remarkably well adapted to a wide range of climate, that the characteristic markings of no other breed can be so frequently seen wherever dairy cows are kept, from the Saint Lawrence to the Gulf, and from ocean to ocean." They derive their name from the island in the English channel, known as Jersey, supposed to be a corruption of *Cæsarea*, as the Romans called it. Though there were importations of this breed, at that time known as Alderneys, to the United States prior to 1840, these im-

portations did not become active until about 1860. Since that time 2,000 animals or more have been imported from the little home island year after year, nearly all of them coming to this country. Jerseys are the smallest in size of the noted dairy breeds, cows ranging from 700 to 1,000 pounds and the bulls from 1,200 to 1,800 pounds. But their average weight in America is considerably above that attained in their native island. Where effort has been made to build up a herd of larger size, mature cows have easily attained an average of over 1,000 pounds. For a time many persons imagined that a pure Jersey had to be of a solid color. This was an error; for all the earliest importations were broken in color. For a long time they were bred almost exclusively for butter. In this country breeders have successfully striven to increase the milk yield, while still maintaining its high quality. A Jersey cow is essentially a machine for producing butter-making milk, and may be considered as worthless when she ceases to give milk. Sometimes a Jersey steer or an occasional non-breeding female has been found to take on flesh and make small beasts for the butcher. They then have a fine-grained, high-flavored flesh, very rich in color.

Guernseys can be better compared with Jerseys than with any other cattle. They are a size larger, stronger-boned, and a little coarser in appearance. They are claimed by some to be hardier and larger milkers, but both these points are strongly disputed. They are called after their native home, the second in size of the channel islands and in common with the Jerseys were long called Alderneys, both in America and England, without regard to the island from which they came. They are light in color, yellow and orange predominating, with considerable white, usually in large patches on the body and legs. On some cows darker shades, approaching brown, occur, and these colors are quite common on bulls of this breed. The cows, when properly handled, are very gentle, and the aged bulls are more easily managed than Jerseys of like age. The Guernsey cows give milk in large quantities, and of uncommon richness in butter-fat and in natural color. Wherever quality secures a good price their milk ranks high in market. They are noted for the richness of their milk, combined with special economy in feeding. The grades, offspring of a Guernsey bull and well-selected cows of no particular breeding, usually make very satisfactory dairy stock.

On their native island their beef is highly prized and young animals are said to fatten easily at a profit. The friends of the Guernsey in this country lay no claims to its being a beef producer; yet when an animal of this breed, if not too old, ceases to be profitable for the dairy, it can be converted into beef without loss to the feeder.



JERSEY FARM.

The Holstein-Friesians, whose native home was North Holland and Friesland, constitute one of the most notable of the dairy breeds. Both in England and America these cattle have been known by several different names, viz.: "Holland cattle," "North Hollanders," "Dutch cattle," "Holsteins," "Dutch Friesians," "Netherland Cattle" and "Holstein-Friesians." After sharp contention in this country the last name was generally accepted; but, says Mr. Alvord, "It seems unfortunate that the simpler and sufficiently descriptive and accurate name of "Dutch Cattle" was not adopted. For it was in Holland, a land noted for a thousand years for dairy products, that this celebrated breed of large bi-colored cattle has slowly but surely developed its present dairy excellence. They are distinguished by "their large frame, strong bone, abundance of flesh, silken coat, extreme docility and enormous milk yield." The original Dutch settlers of New York doubtless brought over with them their favorite cattle (during the 17th century), and there are definite records of not more than three or four importations previous to 1850. But in 1857 began the importations which have steadily increased in frequency and numbers until they are now to be found in all parts of the Union. The striking features of this breed are the color markings of black and white and the large size of the animals of both sexes. They are the largest of all the dairy breeds. Their large frames are usually well-filled out, with the chest, abdomen and pelvic region fully developed. Care must be taken to prevent the males from becoming too heavy for breeding animals, and the females, when not in milk, take on flesh quite rapidly. They are large feeders, and must have abundance of rich food without the necessity of much exertion to get it. The cows range in weight from 1,000 to 1,500 pounds, with a general average of about 1,250 pounds. The bulls, when fully matured, often weigh above 2,500 pounds. The cows are famous as enormous milk-producers. There are abundant records of cows giving an average above their own live weight in milk monthly for ten or twelve consecutive months. There are numerous well-authenticated instances of daily yields of 100 pounds or more for several days in succession, and 20,000 to 30,000 pounds of milk in one year. Cows giving from 40 to 60 pounds (or from 5 to 7 gallons) of milk in a day are average animals, and from 7,500 to 8,000 pounds a year can be depended on as a herd average. The milk of these large producers is generally pretty thin, low in percentage of total solids and deficient in fat. The cows are a favorite with dairymen doing a milk supply business, but their product has in numerous cases been below the standard fixed by State and municipal laws. Some families of Holsteins and some single cows are, however, celebrated for rich milk and fine butter. In

temperament these animals are quiet and docile, bulls as well as cows, the bulls being exceptionally so.

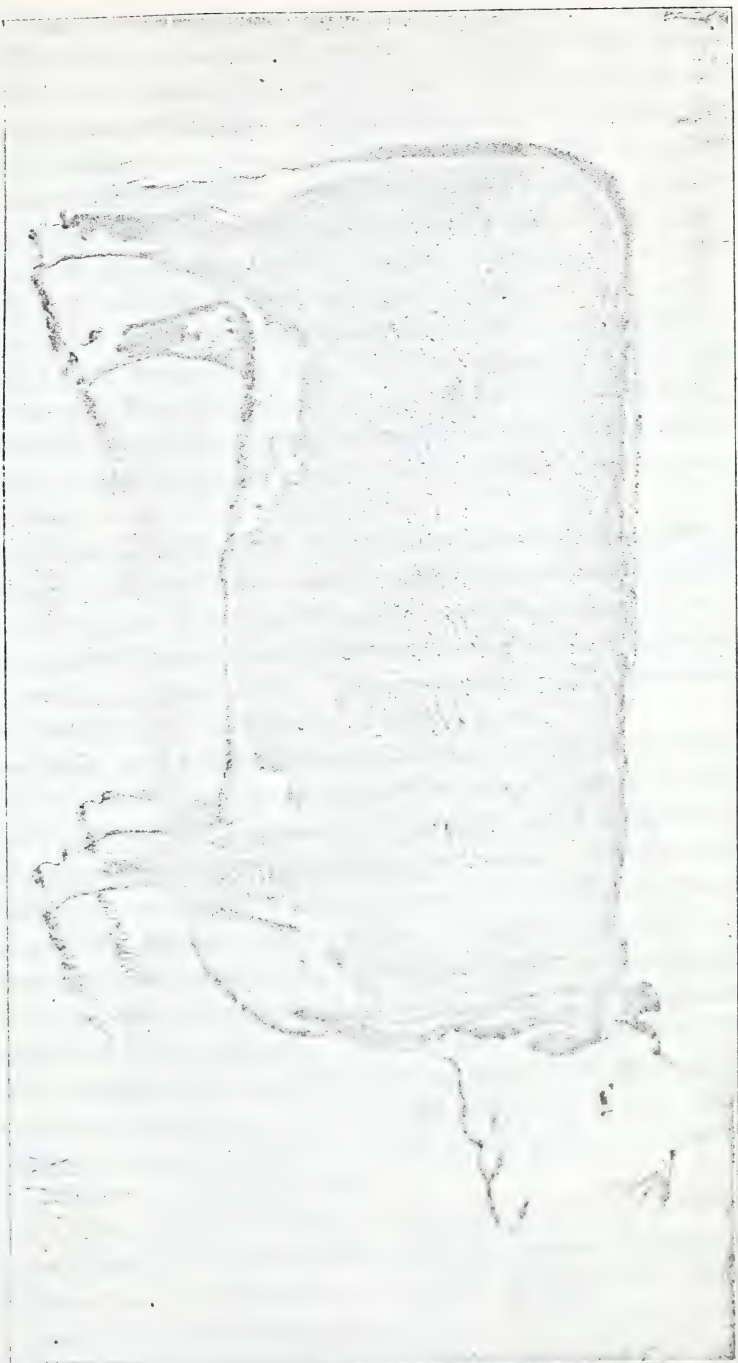
The cattle which have been most famous both in England and America, which have received the longest attention of breeders and improvers, and which have made the most general impression upon the live stock of both countries during the nineteenth century are the Shorthorns or Durhams. They are said to be descended from an old Northeast of England breed, formed by crossing the aboriginal British cows with large frame bulls imported from the continent. Immediately after the American Revolution attention began to be given to the improvement of cattle in America, Virginia taking the lead. During the last hundred years the Shorthorn blood has been more generally distributed through the United States than that of any other cattle. It has been the most acceptable basis for the improvement of the native stock, both for beef and dairy purposes.

The Shorthorns are a beef-breed and have been so for generations. Yet there have always been good dairy cows among them, and some families among them have been kept distinct and are known as "milking Shorthorns." They are probably the largest among pure-breed cattle. Bulls ordinarily weigh a ton or more, some running up to 3,000 pounds. Fully matured cows range from 1,200 to 1,600 pounds, sometimes a little below, sometimes a little in excess of these limits. The colors of this breed have always been red and white, with various blendings of these two. The red is especially fancied in this country. The Shorthorns are generally quiet and gentle. Although they are to be generally classed as beef-cattle, yet there are records of cows giving 6, 8 and 9 gallons of milk a day, with no other food than grass.

Ayrshire cattle are among the youngest of well-established breeds. Coming originally from the country of Ayrshire in the Southwest of Scotland, a region of moderate fertility, where natural pasturage is so sparse that grazing animals must travel long distances in a day to satisfy their hunger, the small, unshapely foundation race has been built up within the nineteenth century by the liberal use of blood from the cattle of England, Holland and the Channel Islands, until they bear little resemblance to the cattle of Ayrshire described in 1825. The breed of the present day bears strong resemblance to the Jersey in certain features. In form, color and horn it is very similar to the wild white cattle of Chillingham Park. With the exception of the little Irish Kerry, there is no cow which excels the Ayrshire in thriving on scanty pasturage and giving a dairy profit upon the coarsest of forage. Yet she responds promptly and profitably to liberal feeding. The Ayrshires are of medium size among

The history of the United States is a story of growth and change. It begins with the first settlers who came to the Americas in search of a new life. They found a land of opportunity, but also one of challenge. The early years were marked by struggle and hardship, but the spirit of the pioneers was unyielding. They built a nation from scratch, one that was based on the principles of freedom and democracy. Over the years, the United States has grown from a small colony to a global superpower. It has faced many challenges, but it has always emerged stronger and more united. The story of the United States is a testament to the power of the human spirit and the ability of a nation to overcome adversity. It is a story that inspires and motivates, and it is one that we should all be proud to share.

HERFORD COW



Dairy cattle. The cows weigh from 900 to 1,100 pounds, averaging probably 1,000 pounds in a well-cared-for herd. The bulls weigh from 1,400 to 1,800 pounds at maturity, sometimes more. This breed is short-legged, fine-boned, and very active. The prevailing color of the body is red and white in varied proportions; in spots, not mixed. The Ayrshire cow yields a large supply of milk. Five thousand five hundred pounds a year as an average for a cow, well cared for, is counted on and often realized. The milk is not exceptionally rich, but somewhat above the average. It is very uniform in character, the fat globules being small, even in size, and not free to separate from the milk. The Ayrshire is not, therefore, a good butter cow, but its milk is admirably suited for town and city supply, being well above legal standards, capable of being carried considerable distances and roughly handled without injury. Some of the cows have been known to produce 8,578 pounds (about 1,000 gallons), in a year.

A good beef breed is the Durham. Some of the cows are good milkers, but the breed is not sufficiently numerous and has not as yet been handled much for dairy purposes. American breeders have succeeded in separating from the general Shorthorn stock a family having all the features of that race, but with no horns at all. These are called Polled Durhams and are now allowed a name and place as a distinct breed.

The Brown Swiss, as the name indicates, had its origin in Switzerland. Among dairy breeds this may be placed in the second class as to size. They are fleshy and well proportioned, with straight, broad back, heavy legs and neck, giving a general appearance of coarseness. But when examined closely they are found to be small-boned with a fine silky coat and possessing many attractive dairy points. They are generally described as brown in color, which runs, however, through various shades, often into a mouse color and sometimes a brownish dun. Bulls and cows are alike docile and easily managed. They weigh from 1,200 to 1,400 pounds on the average, bulls sometimes running up to 1,800 pounds, although they are not so much heavier than the females as in most other breeds. The cows, when developed as a dairy breed, give an average of ten quarts of milk every day in the year.

These cattle, being almost always fat and easily kept so, are good for beef as well as for milk. The flesh is said to be fine-grained, tender and sweet. This breed is not well-known in Georgia. In their native country their ordinary food is nothing but hay, grass, or other green forage throughout the year, but they respond promptly to more generous feeding.

The Devons, so called from the elevated region in the north of Devon-

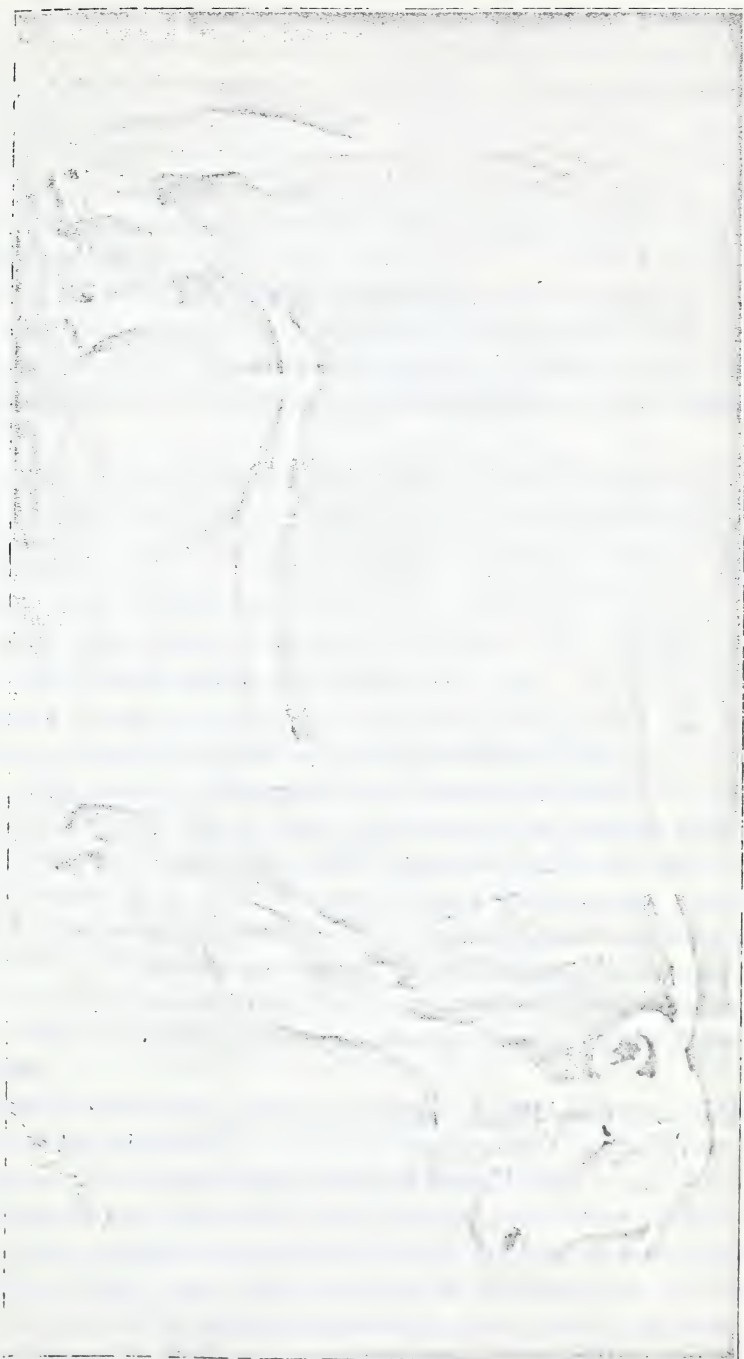
shire, England, were among the very first cattle brought across the Atlantic, reaching New England on the ship *Charity* in the year 1623. But the first herd to be brought to this country and kept pure, so that breeders can still trace it, was sent directly to Mr. Robert Patterson of Maryland, in 1817. There have been many other importations, especially in later years. They are noted for beauty, compactness, intelligence, docility, aptitude to fatten and quality of milk. The horns of the females are particularly elegant, sharp-pointed, black-tipped, and of medium length with a creamy white color and curving upward. In the bull the horns are shorter and straighter. Devons are of medium size. As a rule they do not yield large quantities of milk, though some single animals have given forty or fifty pounds a day. The milk is rich in quality, ranking in that respect next to the Jersey and Guernsey in percentage of butter-fats, total solids and high color. Those who hold this breed in highest esteem regard it as chiefly a beef-producer. Its flesh is fine-grained, usually tender and well marbled, and the fat is of a deep yellow color like milk fat.

The animals of the Dutch Belted breed are all jet-black, with a broad band or belt of pure white encircling the body. The cows seem to give good satisfaction as milkers, although their milk is not above the average in quality. There are comparatively few of this breed in America.

The Red Polled cattle resemble the Devons, as closely as the Polled Durhams resemble the Shorthorns. Yet the two races are probably not closely related, the Devons coming from the southwestern part of England, and the Red Polls having their origin on the eastern plain, north of the river Thames, particularly in the counties of Norfolk and Suffolk. They are hornless cattle, red and other colors. They were among those brought in the early days to the English colonies in America. The so-called "muley" cows among our native cattle are probably their descendants mixed with other strains. The animals of this breed give rather more milk than the Devons, though not so rich in quality. They seem to be better adapted to making meat than producing milk. Their admirers claim that they are good at both and strongly recommend them as the general farm cow. Steers of this breed are special favorites as working cattle.

Other breeds, especially distinguished as beef-producers, are the Hereford and Angus.

If beef breeds are wanted, their superiority is in proportion to their tendency to mature early and to produce beef of high quality. The thoroughbred animals make gains much more rapidly than those of inferior blood, even though the feed be exactly the same in quantity and



HERFORD BELL.

quality. There has been considerable discussion among breeders of beef cattle as to whether the heifer and steer produce equally good beef, or whether that of the former is not preferable. To the latter view the English meat dealers and many of the American are inclined. "A few years ago," says the report of the Kansas State Board of Agriculture, "it was the aim and purpose of both breeder and feeder to produce cattle of great weight and size, nor was the steer considered fit for slaughter or market until he was four or five years old. . . . What a revolution occurred in the early 80's! Every progressive breeder turned his attention at once to the production of perfectly matured cattle at three years as an objective point. The governing law was a triune one—the cattle must possess hardness of constitution, feeding quality and early maturing ability."

The report of the superintendent of the Farmers' Institutes of the Province of Ontario, after describing three well-selected animals of different breeds, an Angus heifer, a high-grade Shorthorn steer, and a high-grade Hereford steer, says: "These animals, though representing different breeds, present that compactness of form, thickness and substance, together with superior finish and quality, coupled with an inherent aptitude to lay on flesh thickly and evenly, that always characterizes the beef animal of outstanding merit." It must be remembered that there is a pronounced dairy type and an equally pronounced beef type. "There are not a few cows of quite positive beef tendencies capable of making very creditable dairy records, and a great many that combine milk and beef to a profitable degree, but a good carcass of beef from a steer of a pronounced dairy type or breed is rarely seen. So clearly and definitely is this beef type established that to depart from it means to sacrifice beef excellence."* Those who are engaged in stock-farming in Georgia will do well to bear it in mind, that for dairy purposes the best breed is the Jersey, while for beef the best types are the Shorthorns, the Hereford and Angus.

Long strides have been made of late years by the dairymen of Georgia toward the supplying of our home markets with butter from their own farms. Though the supply of good home butter is still far short of the demand, yet, as our dairy farms increase, their butter product will more and more supplant the imported article. Georgia, so well supplied, as we have already seen, with abundance of the best grass and forage crops, can also raise its own beef equal to the best, and keep at home the money now paid to the great packing-houses of the North and West. Let intelligent stockmen turn their attention this way with the full as-

*Report of the Superintendent of Farmers' Institute of the Province of Ontario.

insurance that large profits will attend here in Georgia their thrift and enterprise.

Some of our own people engaging in this business of raising beef for the market would make a good profit for themselves and keep money in Georgia that now goes to the West.

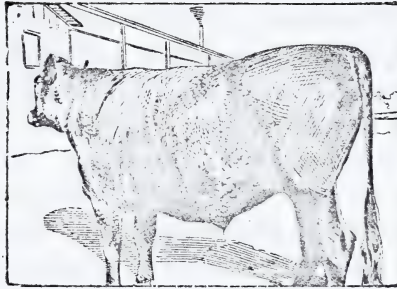
The experience of Mr. T. R. Sawtell of Atlanta, will give some idea of the low price at which cattle can be fed. In a letter to ex-Governor W. J. Northen, he said:

"Below you have the result of my experiment with the thirteen months calf that I fed, exclusively on cotton-seed meal and cotton-seed hulls. I bought the calf from Mr. M. A. Butler of Noah, Tenn., December 16, 1899. He was thirteen months old and weighed 899 pounds. I paid $3\frac{1}{2}$ cents per pound, making the cost \$31.15. I took him to my packing-house and fed him until June 16th on cotton-seed hulls and meal. When slaughtered he weighed 1,320 pounds. He was sold at $5\frac{1}{2}$ cents per pound.

Bought 899 pounds at $3\frac{1}{2}$ cents.....	\$31 15
Fed 180 days at 6 cents	10 80—\$41 95
Sold 1,320 pounds at $5\frac{1}{2}$ cents	72 60
Net	\$30 65

If this can be done by Mr. Sawtell, who makes it a business to supply good beef to the people of Atlanta, would it not pay some of our enterprising citizens to select the best breeds and raise cattle for our markets? If the profit on buying and feeding one calf was \$30.65, that on one hundred calves would be \$3,065.00. If these calves were raised on a stock farm with abundance of pasturage, the cost of their rearing would be less than where all the feed must be paid for at the regular market prices. As has been said before, no State in the Union is richer in pasturage and in grass and forage crops than Georgia. Besides these we have right here on our farms without any freight expense the cotton-seed hulls and meal which make such excellent feed for cattle. If cattle in Norway fed on cotton seed hulls and meal shipped from our country can be sold at a profit in the markets of England, is it not to be supposed that our farmers can raise cattle and sell them at a profit in our own markets?

The most profitable course for the general farmer to pursue in improving the quality of his live stock is to buy first-class thoroughbred males. The calves of a mixed average lot of cows, sired by a thoroughbred bull of any of the best breeds, will partake much of the nature of the sire, and the females of this grade again bred to a thoroughbred will



CALF FATTENED BY T. R. SAWTELL.



BERKSHIRE BOAR—COMMANDER'S AMERICA, REGISTER.
NO. 53869, RAISED AT BELMONT FARM.

NOTE.—For description of Belmont Farm, see Sketch of Cobb County.

give animals equal to the average thoroughbred for all practical purposes except that of procreation. The same principle prevails as to sheep, swine, poultry and all kinds of farm stock. But especially is it true as to the best cattle. The Shorthorn, or Durham, is one of the best breeds for the general farmer. It will give you a steer which, under proper treatment, will at three years of age weigh from 1,500 to 1,800 pounds, and a cow which, with like judicious management, will give from two to four gallons of milk in a day. Be careful to remember one thing. The best breeds will show no superiority over our native Georgia stock, if left to shift for themselves, as is too often done by the average farmer.

On the 1st of January, 1898, there were in Georgia 303,392 milch-cows, valued at \$6,629,115. At the same time there were of cattle other than milch-cow 503,593, valued at \$4,492,300. By the census of 1900 there were in Georgia 20,806 dairy cows kept in barns and inclosures.

As the attention of the breeders of cattle for the dairy and for beef is more and more attracted to the advantages offered by Georgia, there will be given a new impetus to an industry that will add greatly to the wealth and prosperity of our noble State.*

For a more complete account of the breeds of dairy and beef cattle see the pamphlet of Henry E. Alvord, C.E., chief of Dairy Division of the Bureau of Animal Industry of the United States Department of Agriculture, to which we are indebted for much valuable information. See also the other reports from which we have quoted in what has been said about "Stock-raising."

Hogs.—The hog is used very extensively as an article of food both in America and Europe. His flesh, in the various forms in which it is prepared, furnishes the chief meat supply of a large class of our people. Especially is this true of the negroes who constitute in the South almost the entire body of hands employed by our farmers in cultivating the land, looking after the stock, or attending to the manifold labors of the house, garden, field and orchard. Pork, sausage, spareribs, backbone, bacon and ham, are among the most highly esteemed articles of diet in the daily diets of the poor and the lordly mansions of the rich. Just as every farmer should raise his own wheat and corn for bread, so also should he have his smoke-house well stored with bacon and ham of his own curing

* List of names of Breeders of pure-bred Cattle and addresses of their Secretaries for the year 1899:
 American Breeders' Association, C. M. Winston, Brandon, Vt.
 American Shorthorn Breeders' Association, N. S. Fish, Groton, Conn.
 American Dairy Cattle Club, L. P. Sisson, Wheeling, W. Va.
 American Association of America, H. B. Richards, Easton, Pa.
 American Jersey Cattle Club, W. H. Calveell, Peterboro, N. H.
 American Friesian Association of America, F. L. Houghton, Brattleboro, Vt.
 American Jersey Cattle Club, J. J. Hemingway, No. 8 West 17th St., New York, N. Y.
 American Polled Durham Breeders' Association, I. H. Miller, Mexico, Ind.
 Red Poll Cattle Club of America, J. McLain Smith, Dayton, Ohio.
 American Shorthorn Breeders' Association, J. H. Pickrell, Springuel, Ill.

from hogs of his own raising. Thus making on his own lands all his food supplies, he can use the money obtained from his crop of cotton or the surplus of all the products of his fields for the purchase of those things that add culture, refinement and adornment to the home, besides having something to lay up for his own comfortable maintenance in old age, or to add to the inheritance of the children that shall come after him. Every landowner has thus an opportunity, by economy, thrift and enterprise, to acquire a competence and secure his freedom from the cares that torture him who borrows and through interest and mortgages becomes the bond-slave of the lender. Every farmer can, by intelligent use of his resources, live a prince upon his own estate. But the first step toward this happy condition is the raising of his own supplies, so that he can be independent of the meat and granaries of the West. His beef, his mutton, hogs and poultry demand some part of his attention.

The hog, though originally unknown in America, Australia or the Polynesian group, was everywhere introduced by the early navigators, and has propagated his species so rapidly that he is now abundant in all these lands, both in confinement and in a state of nature. Though thriving best in a warm, genial climate, yet, like man, he becomes accustomed to all climates and countries. Where left to roam wild he degenerates into the razor-backed animal of the mountain or the pine land region. Where properly cared for and developed by careful breeding, he becomes the sleek, fat porker of the well-kept farm.

From the wild boar, once so common in Europe and Asia, the domestic hog, wherever found, has sprung. At what time breeding for the improvement of the wild animal began we do not know, although we are told that the ancient Romans made it a study.

England seems to have taken the lead in this useful art. The swine-raisers of her different provinces endeavored to improve their own breeds by crossing the fine-boned hog of China with the larger breeds of England and other countries. By their selections, crossings, and re-crossings, have arisen the varieties which take their names from the provinces which first produced them, as the Berkshire, Suffolk, Essex, Chester, etc. It is not our purpose to go into a description of these various breeds. Most of the best breeds have been tested by the farmers of this country; and at one fair or another all the improved breeds have taken premiums. The great object is to secure such as are hardy, and will make the greatest supply of pork and lard with the least amount of feeding. If bacon is the object desired, it is well to select the large and heavy variety. If pork is the thing desired, choose the smaller varieties, such as arrive with greatest rapidity at maturity and are likely to produce the most delicate

flesh. The keeper of the hog should be just as careful to see that the sty or yard is kept clean, as to furnish him the food which experienced farmers have found to be best suited to his needs.

Cleanliness and careful attention are very necessary to secure the best results, both as to the healthfulness of the animal and the consequent excellence of his flesh for food. Among the fine breeds the Berkshire is the most generally distributed throughout Georgia. Next in popularity comes a breed which results from a crossing of the hog of Poland with that of China. We have also the red Jersey hog, the white Chester, and other valuable breeds. All of these do well in Georgia. Our farmers are, of course, familiar with the various diseases to which hogs are liable, and also with the remedies. Many of them, especially skin diseases, can, in a great measure be prevented by keeping the pigsty or yard as clean as possible, and by seeing that the hog gets wholesome and suitable food. In the case of an animal that furnishes such a heavy per cent. of the meat supply of our people, too great precautions cannot be taken in guarding him against any of the causes that would tend to make his flesh unwholesome.

By the United States census of 1890 the number of swine in Georgia was 1,396,362. By the Year Book of the Department of Agriculture for 1899 we find the number to be 2,093,987, valued at \$8,095,353. The increase in the number of swine from 1890 to 1899 was 697,625, a gratifying exhibit, in that it shows, that the farmers of Georgia are raising more of their own supplies and depending less on the packing-houses of the West.

Sheep.—In the section on grasses and forage crops the adaptability of Georgia to sheep husbandry was incidentally referred to. In 1875 Hon. Thomas P. Jones, then Commissioner of Agriculture, issued a pamphlet on Sheep Husbandry in Georgia which met with such high favor not only in this State, but also in the whole country, that in 1883 his successor, Hon. J. T. Henderson, republished it, with such additions to the original as were deemed necessary to give more fully a great amount of desirable information on this subject. We deem it well to acknowledge in the outset our indebtedness to the aforesaid publication, for many facts herein recited. According to the United States census of 1860 the number of sheep in Georgia was 512,618. From that time to 1875 there was a steady decrease, the number in the State being less by 193,295 than in 1860. Doubtless some of this loss was due to the ravages of war, some to thieves during the disordered times that immediately followed the close of hostilities, but the greater part to the ravages of dogs. Through the persistent efforts of the friends of sheep industry the legislature was pre-

vailed upon to pass a dog law allowing each county to enact its provisions within its own borders, as it might see fit. The law has been adopted in many counties with very beneficial results, and in those counties the industry of sheep-raising has taken on new life. Many more counties will doubtless adopt it and then Georgia will resume her proper position as a wool-producing State. In this industry, as in everything else, one must be convinced that it will pay before he will put his money into it. The climate of Georgia corresponds with that of some of the best wool-growing regions of the world. The southern part of Spain, a country once famous for its merinos, is warmer than South Georgia. Australia, one of the chief wool countries of the world, has a warmer climate than Georgia. In the cost of keeping sheep warm climates have a decided advantage over cold ones. In Southern, Middle and Northern Georgia sheep have been kept with a profit to the owner far in excess of that derived from cotton, notwithstanding the ravages of dogs. In Southwestern Georgia snow never falls and the ground seldom freezes. The pine forests are carpeted with native grass, affording rich pasturage all the year. According to a statement of Mr. David Ayers of Camilla, Mitchell county, his flock of 3,500 sheep cost him annually 14 cents a head and the average yield a head was three pounds of unwashed wool, at 30 cents a pound. Owing to its freedom from hay-seed and to the fact that our heavy spring rains wash out the yolk and dirt, the unwashed wool of Georgia is as clean as the brook-washed of Pennsylvania. He did not feed his sheep at any time during the year, and used only what is known as the native stock. Of course the cross of the Merino with this stock would have given a greater quantity and better quality of wool. During the same year a Mr. John McDowell of Washington county, Pennsylvania, on land that cost five times as much as that of Mr. Ayers, made only one half of the profit on money invested in the best breeds of sheep. Thus it seems that where sheep-husbandry is made a specialty Georgia has a decided advantage over Pennsylvania.

Mr. Robert Humber, of Putnam county in Middle Georgia, kept 138 sheep of the cross between the Merino and the common stock. He said that they cost nothing except the salt eaten by them and paid 100 per cent. on the investment in mutton, lambs and wool. They ranged on Bermuda grass in summer, and on the fields from which the crops had been gathered, and on the cane bottoms in winter. Their only food was that thus gathered by themselves. They yielded an average of three pounds of wool to the head, which he sold at twenty-five cents a pound.

Mr. Richard Peters, who kept sheep in Gordon county and had an experience of twenty-seven years, and had tested the Spanish and French

Merinos, Southdown, Oxfordshire-Down, Leicester, Asiatic Broad-tail, or Tunisian, Improved Kentucky Cotswold and native sheep, said that a cross of the Spanish Merino and natives had proved most profitable with him. Every other Georgia correspondent agreed with him in this opinion. The progeny of the native ewes and Spanish Merino bucks showed "marked improvement, having constitution, fattening properties, thriftiness and a compact, close fleece." While he raised only 70 lambs to every hundred ewes of the pure Merinos, he raised a lamb for every ewe of the cross-bred natives and Merinos. During mild winters in Gordon county his sheep had to be fed only 30 days; in cold, wet winters, twice that long. In speaking of the value to land of sheep manure Mr. Peters said: "I can only judge of its value by the compact sod of grass on my sheep pasture, capable of sustaining ten head to one as compared to twenty years ago."

The experience of Mr. Peters agreed with that of almost all the other sheep-raisers in Georgia as to the breeds most suitable to this State. The Merinos are better suited to our climate than the long-wooled Leicesters and Cotswolds.

Every sheep-raiser should remember the maxim that increase of lambs is increase of wool. Special attention should be employed to have the lambs come at the best season. The period of gestation is 151 or 152 days. The best time for the coming of the lambs is, for Middle and Lower Georgia, about the first of January; for North Georgia, either in November, or about the last of February and first of March.

During the short period in North Georgia when sheep must be fed green food afford a cheap and excellent food. These, with oats or rye pastures sown in the early fall, will afford sufficient food to induce an abundant flow of milk for the lambs, and at the same time will keep the ewes in a healthy condition, and thus increase the clip of wool for the next season. Quantity and quality of wool will be greatly improved, and the health of the sheep be preserved, by keeping them in a uniformly good condition throughout the year. Do not allow them to grow thin during the winter. That part of the fiber grown during a poor condition of a sheep will be weaker than that grown, when abundance of food is supplied and all proper attention is given to the animal. Weak points in the fiber injure its quality, and of course its sale. For this reason wool grown in warm climates, where there is a continuous supply of green food, is heavier and of better quality than that grown in colder climates, where the sheep necessarily grow thin during severe winters. There is among sheep-raisers a maxim that for sheep "change is more important than range." In the extensive sheepwalks of the northern

sections of Georgia or the wire-grass regions of the southern section, the flock can find the necessary change by extending their walk. But when they are kept within inclosures, in order to insure their health and variety of food, they must occasionally be changed to new pastures.

If they are to be grazed upon 100 acres, it is a good plan to divide this land into two fields of 50 acres each, and let the flock alternate monthly between them. They ought to have fresh shading ground during the day and fresh beds at night. Where the sheepwalk is always the same, certain pungent plants necessary for the health of the animal become exhausted. During the summer sheep feed early in the morning and late in the evening, spending the middle of the day in the shade. Since they seek the same sheltering places from day to day, these resorts become foul and hurtful to the health of the flock. If a change of pasturage is not practicable, these places should be occasionally cleaned off, and the manure from them should be saved.

All changes from pasture to pasture, or from pen to pen, should be made in the cool of the evening or early morning (the latter being the better), so as to avoid disturbing the flock in the heat of the day.

Salt should be constantly accessible to the sheep and in sufficient quantities to prevent scuffling and fighting over it. Or a good plan is to salt them regularly twice a week, placing the salt in troughs or on clean rocks. It is best to give the salt in the evening, because in this way too free use of water after salt, which is not good for the sheep, will be avoided. It will be found very conducive to health to dig troughs in ordinary pine poles and fill them with common tar sprinkled with salt. These being arranged at a convenient point in the sheepwalk will furnish salt and at the same time induce a moderate consumption of tar, which acts as a disinfectant and promotes health by checking the fly which sometimes in the summer months deposits its eggs on the nostrils of the sheep, thus producing worms in the head.

The sheep is exceedingly neat and even fastidious about its food. Hence it should have clean grass and clear, running water. Though they do not use as much water as other animals and sometimes go days without it, their comfort and health require that it should be accessible.

In spring and summer the flock should be closely watched for maggots in the wool, whose presence will be indicated by a dingy, bluish appearance. Spirits of turpentine should be promptly used on the infected parts; for if the flesh become penetrated, serious injury, if not death, will follow.

If not salted regularly in wet spells, diarrhea is apt to follow, with a fouling of the wool in the rear. These "tags" must be promptly removed



SOUTH DOWN EWES.



SOUTH DOWN RAM.

with the shears. If the disease is obstinate, the sheep should be fed for a few days on meal with a little salt in it and other dry food, if the animal can be induced to take it.

For the shearing of sheep clear, warm weather should be selected, not so early as to risk the health of the sheep by cool spells coming after the removal of its winter coat, not so late that this coat has become oppressive or has commenced to waste and shed in order to make way for another.

In butchering the intestines should be removed at the earliest possible moment after life is extinct, and before the removal of the pelt, if necessary, so as to avoid the peculiar sheepy odor and taste sometimes found in mutton, and erroneously supposed to be due to the contact of the wool with the meat.

The same result may be accomplished by pouring a bucket of cold water into the cavity as soon as opened and before the removal of the bowels. With proper attention to the butchering of well fattened sheep, all unpleasant odor or taste will be avoided, and the prejudice which many people feel toward mutton will be removed.

Properly served, lamb or mutton furnishes a meat at once wholesome and much more delicate than the gross hog meat so universally consumed in Georgia.

There are in Georgia nearly 10,000,000 acres of practically unoccupied lands. Nearly all of these could be profitably used as sheepwalks. There is an extensive region, beginning in Southeastern Georgia and extending across the State from the Savannah to the Chattahoochee. This section is made an ideal home for great flocks of sheep by the native wire-grass and other herbage which, with their luxuriant growth, afford excellent summer pasturage, while the aftermath, remaining evergreen and reinforced by healthful winter-growing weeds, gives ample feed for the cold season. Besides, there is the Bermuda, most valuable of all spontaneous grasses, equal on good soil to the best blue-grass of Kentucky, and capable, even on land unprofitable for cultivation, of supporting five sheep to the acre for nine months of the year. Where partially protected by pine trees, it will remain green throughout the winter, supplying pasturage for that season. Or from the summer pasturage the sheep may be turned upon the pea fields from which the corn has been gathered, care having first been taken to accustom them to the consumption of the pea, as a guard against over-feeding. From the pea-field they can be turned into the cotton-field, which in August or September had been sown in rye or oats. These, together with the rutabaga turnip crop, which was also sown in July and August, will afford ample green pasturage until the return of the spring vegetation. Or, if a harvest from

the grain fields be desired, the turnips can be reserved for early spring feeding, since such a grain field should not be grazed upon later than the first or last of February, according to latitude. Such is the advantage of the climate of Middle and Southern Georgia, that small grain can furnish green pasturage all winter, and a paying crop the next summer. In the southern half of Georgia turnips need no protection, and can be utilized with no more labor than is required to change a movable fence as often as fresh pasturage is needed; or they may be banked like sweet potatoes, and in the spring be fed, after being reduced by a pulping machine. Wherever the sheep are fed, either on extensive "walks" or inclosed in narrower bounds, they heavily fertilize the soil.

One great economical consideration in Georgia's favor is, that in its larger portion sheep do not need winter shelter.

By utilizing Bermuda and wire-grass for summer pasturage, and small grain and turnips for winter, Georgia, without neglecting her cotton, corn, grain or forage crops, and while increasing the number of her dairy farms and creameries, her beef cattle and her swine, and extending her factories of varied kinds, can build up another great industry of sheep husbandry, supplying her own markets and those of other States with the best of mutton and lamb, and deriving a large profit from the sale of millions of pounds of wool. Georgia can easily sustain 4,000,000 sheep and at the same time largely increase her agricultural products by converting much wasting vegetable matter into a superior fertilizer.

In the portions of Georgia where the sheep can have extensive range, they, for the most part, take care of themselves without taxing either the time or attention of their owners. It was in consideration of this fact that Mr. Janes, Georgia's first Commissioner of Agriculture, spoke of sheep as "the best, most quiet, peaceable, industrious and profitable laborers, who nearly double their number annually, demand no wages, do not steal or commit other crimes, labor assiduously throughout the year, feed and clothe themselves and their masters, make no strikes, utter no complaint, and never 'die in debt to man,' "

There are sections of Georgia which do not afford such extensive sheep-walks or ranges, and where those who prefer these sections for climatic or other causes must, if they desire to engage in the business of sheep-husbandry, grow their sheep upon inclosed farms and provide for them shelter against the inclement winter. Let such remember that millions of the best sheep in the world are raised upon inclosed pastures in England, upon the continent of Europe (especially in France), and in America. With one tithe of the care, attention, expense and worry bestowed upon cotton devoted to sheep-husbandry, the latter can be made

to quadruple the net profits of cotton culture on any given area of dry and reasonably fertile land in Georgia. The fact that the native flocks of sheep in the southern part of the State, without attention prove profitable to their owners, furnishes abundant evidence that under a more rational system in which ewes and lambs, at least, would have the benefit of small grain pastures, or other suitable feed during the winter months, the profits would be much larger than under the present "let-alone" plan. Our neighbors just to the north of us, Tennessee and Kentucky, make enormous annual profits on early spring lambs shipped to New York and Boston. "Georgia" says Mr. Henderson, "might anticipate these sources of supply at least one month, by having the lambs dropped in November and grown upon succulent pastures of small grain sown for the purpose. If butchered beef can be profitably shipped from Chicago to Georgia markets in refrigerator cars, why may not our early lambs be shipped to Chicago in the returning cars?"

The offspring of Cotswold bucks and native ewes would be little, if at all, inferior to the thoroughbred for mutton.

Notwithstanding the risk of depredation by dogs, sheep-husbandry can be made profitable in Georgia if proper attention is bestowed upon the sheep. A single, faithful hired man can care for a thousand sheep, except at shearing time, when extra labor will be needed. The annual net income from the flock would exceed that from an area equal to the sheep pastures planted in cotton. There are few farms in Georgia on which it will not pay to pasture some sheep. Those inexperienced in sheep-husbandry should begin with a small number, which may be increased in proportion to their growth in experience and skill. To those who have experience in this business we say: "There is room enough and a hearty welcome in Georgia for you all."

To those of our own people, who depend upon agriculture for a livelihood we commend the words of Charles L. Flint, for twenty-eight consecutive years secretary of the State Board of Agriculture of Massachusetts, author of several valuable treatises on subjects pertaining to the farm, and editor of others, especially of *The American Farmer* published by Ralph H. Park & Co. of Hartford, Conn.:

"Unlike the culture of cotton and other textile materials, the cultivation of which is confined to certain localities of our country, wool-growing can be successfully practiced in every State in the Union and its territories, being suited to all soils and climates. The South and West are sections peculiarly adapted to this enterprise, while in New England it must of necessity be limited, owing to the density of the population and the small size of the farms in that section. In the south the season

for winter feeding is much shorter than at the North, affording an opportunity to depend more upon pasturage in maintaining the flocks, while the well-sheltered valleys afford protection from the severity of storms in winter and induce an early growth of spring grasses. The infertile and worn-out lands can by this means be reclaimed to cultivation and fertility. By the more general recognition of sheep-husbandry as an adjunct of southern agriculture, for a few years, a marked improvement in soil, general agriculture and State wealth must of necessity follow. The remarkable success attending wool-growing in New South Wales, which is a region of excessive heat, proves what can be accomplished."

In an article on "Wool Industry in our National Economy" Hon. John L. Hayes says: "The relations of domestic wool to domestic manufactures are equally conspicuous and important—the rule being that the characteristic wool manufactures of the leading nations have been determined by the abundance and peculiarities of their raw material."

After citing as examples the carpets and rugs of Turkey, the dress fabrics of England, the fine broadcloths of Germany, and the infinite variety of the luxurious dress-goods of France, and showing how all of these great enterprises grew out of the sheep-husbandry of those countries, Mr. Hayes continues: "The wool manufacture of the United States is dependent upon domestic wool production. The two branches of wool industry have always stepped together. The more prominent wool-growing States have woolen-mills. It is safe to say that not one of these mills would have been established but for the contiguous flocks, and if forced to seek imported wool, each one would stop."

But some one may say, what has the farmer to do with woolen-mills? How does their establishment concern him? Much every way. Whatever increases the demand for his products increases his opportunities for profitable business and the legitimate acquisition of wealth. The farmers of those sections of Georgia adapted to sheep-raising, can, by an intelligent use of the resources within their reach, help to build up new manufacturing industries, which, as they increase in number and in financial strength, will amply reward the thrift and enterprise of those on whose well-directed work their own success depends. Thus agriculture manufactures and commerce, going hand-in-hand, and mutually dependent, will by their united energies place Georgia in the front rank of the richest, greatest and most populous commonwealths that constitute our grand American Union.

In 1890 there were in Georgia 440,459 sheep on farms, and their wool-clip was 841,141 pounds. The census did not say whether the wool included washed and unwashed. According to the annual report of the



REARED IN GEORGIA BY BELMONT FARM,
SMYRNA, GA. Cobb Co.

Bureau of Animal Industry published by the United States Department of Agriculture in 1899, there were in Georgia at that time 294,826 sheep, and their wool-clip was 1,218,612 pounds, washed and unwashed, of which 731,167 pounds were reported as scoured wool.

The Yearbook of the Department of Agriculture for 1900 reports 271,534 sheep sheared, their wool-clip being 1,086,136 pounds washed and unwashed, and 651,682 pounds scoured wool. The sheep kept in inclosures are reported by the census to be 5,745.

POULTRY.

There is scarcely any food more highly appreciated by the great majority of people than the flesh and eggs of the various kinds of poultry to be found on almost any farm. Even the poor man, with but a few acres owned or rented, can, with a little care, raise enough chickens, turkeys, geese and ducks to supply his own table with the wholesome and palatable food which they afford.

Very few people keep any account of the expense and profit of poultry. If you were to ask them whether it pays, they could not tell; for they keep no account of eggs or chickens used or sold, or of the cost of the food consumed by them. The commonest fowls, that are left to shift for themselves, at least pay their way. Take those same fowls and give them the care and attention that all poultry should have, and they will bring in a handsome profit on the investment.

One of the secrets of the success of agriculture in France, is the attention bestowed upon the small industries of the farm; and one reason why many of our farmers fail to make as large profit as they might, is their neglect of small things. With proper attention to shelter, feeding and cleanliness of the fowls, the breeds commonly known throughout our State will not only supply the farmer's own table, but also prove a profitable part of his farm produce. There is always a good and unfailing market in our cities and towns for poultry and eggs, and the demand for these articles will increase with the growth of our municipal population. In fact, there is nothing on which the small farmer can more securely depend. Every true woman delights to be a helpmeet to her husband, or her father, not only by economy and saving at every possible point, but by the wise planning of her head and the diligent labor of her hands. Nothing better suits the farmer's wife or daughters than the care of the poultry. And in this task there is abundant need and opportunity for the employment of tact, skill and scientific knowledge.

Let it be understood that the intelligent application of one's knowledge or experience, even though that one be a person unlettered and unlearned, is scientific. The female members of a household on a small

farm, which affords but one or two milch-cows, a few hogs, a few beehives, and some poultry, can, by thrift and economy, furnish a large proportion of all the food consumed by the family, keeping the table supplied with milk, butter, honey, chickens and eggs, looking after all the wants of the home, while father or brothers drive the plow, or with their single mule, perchance, carry to market the little surplus that remains over and above the supply of their own needs. Many a thrifty household, in which each member lends a helping hand, has, by wise management, been able to add from time to time a few acres to their possessions until the small farm has become a large one, and their intelligent industry has been rewarded by competence and ease.

The poultry has so often, like the hogs and sheep, been left to shift for itself, that the profits derived from this industry, where well managed, have in many instances been greatly underestimated or altogether overlooked.

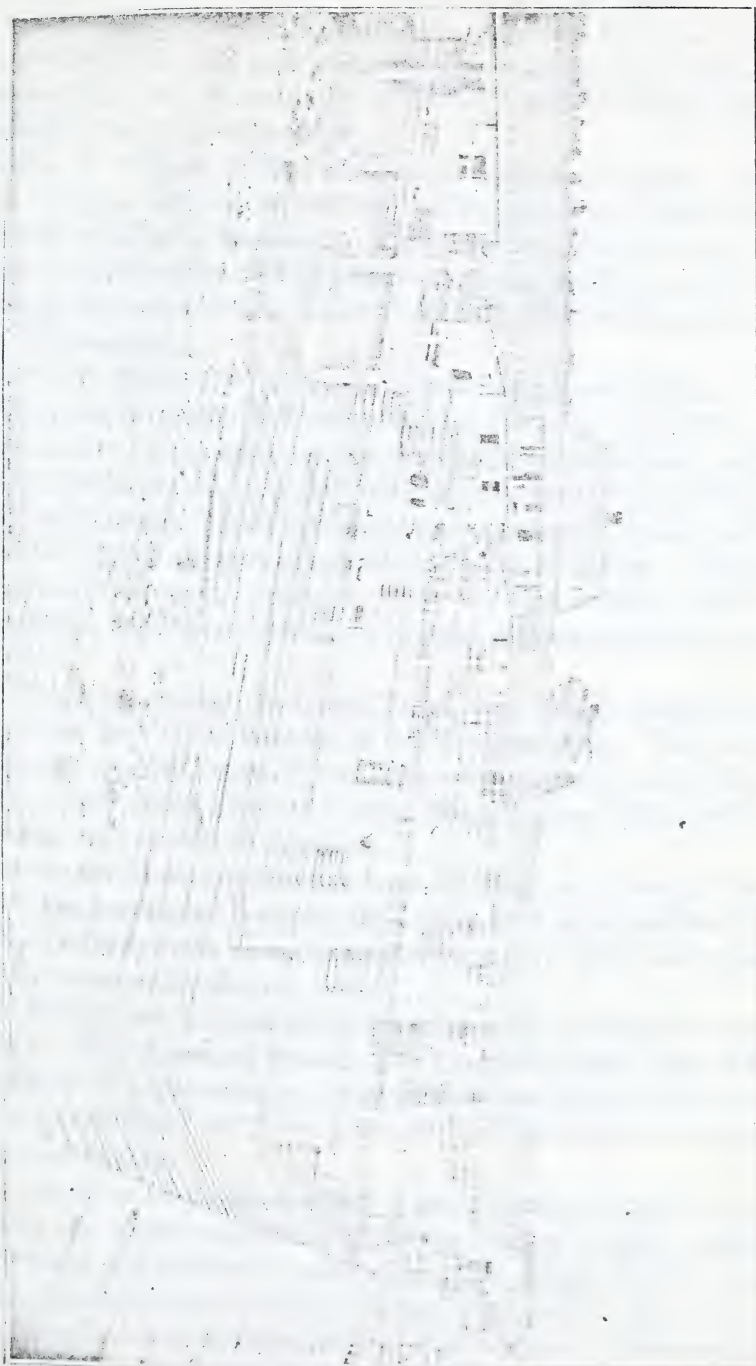
In considering this subject a very important question is: "What are the best breeds for Georgia?"

Of chickens the preponderance of evidence reported by correspondents continues to favor the Plymouth Rock, if but one breed is to be kept. Next in favor for general purposes comes the Light Brahma. The Leghorn is the universal favorite for egg production, the Brown variety being generally preferred. In his "Manual on Poultry" published in 1883, Mr. Henderson gave the testimony of some of the most experienced breeders in Georgia. Mr. Edgar Ross of Bibb county, after experimenting with more than twenty varieties, said that the Brown Leghorn gave the most satisfactory result as a combination fowl for eggs and table use. "They are excellent egg-producers, summer and winter, and the chicks mature rapidly, being ready for the table at ten weeks old—flesh of excellent quality." He pronounced the White Leghorns as good layers as the Brown, but preferred the latter on account of their color. They begin laying when five months old.

After making every conceivable cross with twenty odd varieties of thoroughbreds and common stock, he considered the cross of the Leghorn and Light Brahma the most satisfactory. Brahmas are excellent mothers and good egg-producers. Leghorns are the best of layers, but are non-sitters. The cross between them possesses both the qualities to perfection, losing the clumsiness of the Brahma and inheriting the activity of the Leghorn.

Mr. F. N. Wilder of Monroe county, who had bred the Light Brahma, Dark Brahma, Brown Leghorn and Plymouth Rock, preferred the Light Brahma as a combination fowl, which he thought unsurpassed as a table fowl. He fed his chickens regularly, and always had fresh water access-

VIEW OF CHICKEN HOUSES AND FENS, BELMONT FARM, MASSACHUSETTS



ible to them in clean earthen vessels, putting in a few drops of carbolic acid twice a week. He kept their quarters clean and free from vermin, and provided them with good dust baths into which a little sulphur was occasionally poured. Occasionally he hauled a load of cinders from the blasksmith's shop into their yards.

Messrs. J. T. Scott & Bro. of Crawfish Springs, in Walker county, North Georgia, obtained satisfactory results from some breeds not approved by breeders farther south. They tried both the Dark and Light Brahma, the Partridge, Buff and White Cochins, the Brown and White Leghorns, Plymouth Rocks, Black Hamburgs, Golden-Spangled Hamburgs, Houdans, etc.

Mr. W. C. Tate of Overton P. O., Elbert county, one of the most successful raisers of poultry in Georgia, raising annually from 300 to 500 chickens, after having tried the Langshans, Buff Cochins and many of the other special breeds, in conversation last summer (1900), said that he considered the Indian Game the best of all for general purposes, and that he had for the last six years practically discarded all others. They are a hardy, thrifty, compact, closely-built fowl, the hens weighing from four to six pounds, and the cocks from six to eight, making excellent meat for the table.

The game is certainly the typical breed, most closely resembling the wild parent, the *Gallus Bankiva* of Southeastern Asia. The hens are good layers, superior sitters and unsurpassed mothers, too much disposed to fight young chicks of other broods, but with great spirit defending their own brood against all intruders.

Our common Black-red Game, nearest kin of all our domestic fowls to the common ancestor of them all, the Jungle fowl or *Gallus Bankiva*, is the variety from which so many sub-varieties have been bred by selection or crossing with others.

The Dominiques, in their plain homespun suits, were once a favorite among the older American breeds. The Plymouth Rocks, now so highly esteemed, are supposed to be a cross between the Black Java or Cochin and the Dominique. Of the later breeds the Wyandottes and Sebrights are growing in favor.

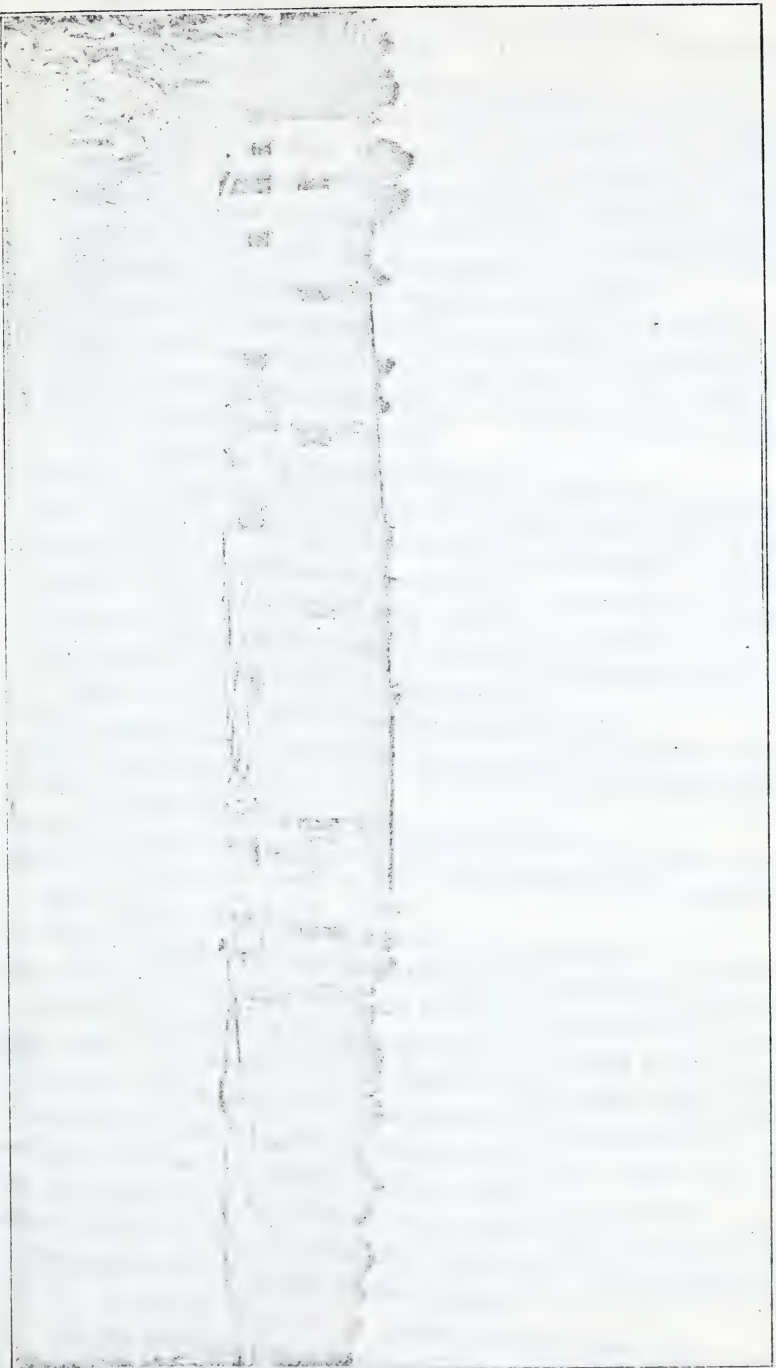
The variety to be grown should in a great measure depend upon the extent of the range available. All of the smaller varieties require a liberal range for maximum production. The larger breeds, such as Cochins, Brahmas, etc., though thriving better with a tolerably wide range, suffer less from close confinement than Leghorns, Games and other small varieties. If the fowls must be confined to a small area, then the breeder must supply by artificial means the conditions of the wider range.

Birds at liberty to roam find for their sustenance seeds of various kinds, a variety of green vegetable matter and insects. If confined within narrow bounds, they must be supplied with what they desire and need, by the foresight and provident care of the owner. Otherwise the fowls will suffer privation and become unprofitable. If there is not an abundant supply of perennial grass to which the fowls have daily access, small grain of some kind should be sown for them as pasturage for fall, winter and early spring. Breeders of poultry in Georgia do not need to construct close houses for their shelter. In our warm climate such houses are sources of disease and death to the poor birds, by reason of the impure air which they breathe. Mr. Henderson says: "They may be used during the winter months to advantage, if well ventilated, but the fowls should be excluded from them from May 1st to October 1st, and required to roost either in trees or open sheds. Thorough ventilation is absolutely necessary, even in winter, to prevent disease." The ventilation should be above the roost. The roof of the chicken-house should be close enough to keep out the rain and all its sides, except the south, should be close enough to exclude the cold winds.

It is better to let the fowls roost on trees, where the whole body is exposed alike to the cold than to be confined in a house, in which they are exposed to draughts of cold air. The roosts should not be higher than thirty inches from the floor of the house, or eighteen from its sides. If too high, the larger breeds will be apt to injure themselves in getting up or down. It is a good plan to place a shelf about two feet wide immediately under the roost and about eighteen inches from the floor. Over the shelf should be sprinkled coal ashes or cottonseed to catch the droppings, which should be collected and removed every two or three days. The floor of the chicken-house, whether of dirt, planks or cement, should be occasionally sprinkled with diluted sulphuric acid, which should be carefully handled, so as to avoid injury to the clothing or person of those applying it. Thorough whitewashing twice a year helps to purify the house and keep it clear from hurtful insects. Fumigation with tobacco smoke is very beneficial.

It is better to make the nest upon the ground than upon planks. A nest of green cotton seed hollowed into the form in which the hen prepares it when left to herself, is in some way offensive to mites and other injurious insects. The material of the nests that have been used by sitting hens should be entirely removed and either burned or thrown into the manure pile.

In the climate of Georgia fowls are more healthy if required to roost in the trees during the summer. Indeed, they would be healthier roost-



BROODERY AND INCUBATOR HOUSE (IN COURSE OF ERECTION) BELMONT FARM, SMYRNA, GA.

ing on trees throughout the year; but will produce more eggs in winter if kept in comfortable houses.

The appearance of disease among poultry is generally the result of neglect. If contagious diseases appear, the best plan is to kill the diseased fowls, and either burn or bury them at a distance from the run of the balance of the flock. Then the premises should be immediately disinfected by the use of sulphuric acid, all the well birds being kept from the yard, if possible, until the disinfection is complete.

By universal consent the turkey is considered a native of the western continent. All our domestic breeds of turkeys probably have a common origin from some one of the original types of wild turkeys. The principal varieties of domestic turkeys are the Bronze, the Cambridge, the White Holland and the Norfolk.

The Bronze in his plumage resembles very closely the common wild turkey of our forest (*Meleagris Americana*), and seems to be the result of a cross of the wild gobbler upon the domestic hen. Turkeys of this breed are very handsome and much larger at maturity than those of other breeds, the gobblers sometimes weighing as much as forty pounds. They retain more of the traits of the wild turkey and cannot be kept unless the farm affords them an abundant range.

Other breeds are more domestic, but are of smaller size and less hardy. Many turkeys are of variegated colors, which results from the intermixture of various breeds.

Very little attention has been paid to their breeding in comparison with that given to chickens. The bronze variety is the result of greater care in this respect.

The breeding of turkeys on a small scale is not apt to be profitable, but on large farms, where they have the run of the stubble after grain has been harvested, they can be raised with small cost and little trouble.

The hens begin to lay in early spring and lay from twelve to eighteen eggs each. If allowed to do so, they will seek their nests in some secluded spot, where they will not be disturbed by the gobbler who, by his awkward attentions, sometimes damages the eggs. Some allow the turkey hens to have their liberty. Others take them to houses, as soon as they show an inclination to brood, while others shut them up and compel them to lay in the house, where they are to sit. If not disturbed, they usually hatch well under any of these plans.

In the *American Farmer* a poultry-breeder gives his experience thus: "All the first lot of eggs received I placed under hens for hatching, and you will find that the turkeys will have finished their second laying a few days before the hens have finished hatching. I then take the

eggs from the hens and give them to the turkeys, and sometimes the turkey has only to sit a few days, when she has her young. If I am compelled to leave some of the eggs with the fowls to bring out, I deem it an indispensable requisite to see to it that the hen is perfectly free from lice, using pulverized sulphur, etc., freely. I regard it as next to impossible for hens to raise young turkeys, for turkeys are exceedingly tender when young, and above all things they must be kept free from the parasites that infest the common fowl. They must not even be allowed to remain over night about the same building, where the common chickens are kept. Do not be afraid of putting as many as forty or fifty young turkeys with the old mother turkey, but keep them in a dry, warm place, especially over night."

Young turkeys should be scrupulously protected from rain and not allowed to run in grass, which is wet with dew or rain. The floor of their pen must be kept dry and clean, and pure, fresh water must be constantly within their reach.

Young turkeys do not need to eat at all, until two days old. The utmost care must be taken in feeding them. Hard boiled eggs, or curd pressed every day, will prove the safest food for the first two weeks. After this, bread, soaked in just enough milk to soften it, is a safe and healthful food. The health of the chicks will be materially aided by feeding to them the tender tops of onions, garden fennel, purslane or dandelion, chopped fine and mixed with other food.

Young turkeys are delicate until the red begins to appear upon their heads. From that time they are hardy, and, if allowed a liberal range, will take care of themselves.

In rearing large, strong turkeys, much depends upon careful selection of the breeding stock. The practice of sending to market, about the time of Thanksgiving or Christmas, all the largest and heaviest birds, and keeping only the late ones of inferior size for breeding purposes, is a bad one. The turkey does not attain its full maturity until the third year. Some of the largest should always be kept; for from matured parents only can the largest and strongest chicks be secured.

Every year thousands of dressed chickens and turkeys are shipped from Tennessee to our Georgia cities and towns. Why cannot our own farmers supply this demand and keep the money at home that now goes beyond the limits of the State?

All the varieties of guinea fowls are supposed to have originated in Africa. Some have a peculiar bone-like helmet on the top of the head, while others have in its place a crest of feathers. They are very useful where there are many enemies to poultry, such as hawks, crows, rats, etc.

Being ever on the alert, they give the danger alarm with a loud shrill cry. An extensive poultry-keeper says of them: "To any one keeping a large number of hens a pair of guineas is a good investment. I know from experience that they will, and do, keep hawks away. We have for several years past lost but one chicken by the hawks." They are prolific layers during the summer season. Their eggs are small, but rich in flavor, and make up in numbers for what they lack in size.

A good plan is to let chicken hens raise the young guineas, as they grow up more gentle and manageable than when reared by the guinea hen. Their flesh is very palatable to those who like a gamy flavor and dark meat.

The peafowl is an ornamental bird, and is peculiarly appropriate to spacious grounds or lawns, but is not much desired by poultry-raisers.

Ducks and geese may be successfully raised under domestication, without more water than is afforded by an ordinary drinking trough; but since in the wild state they live a great part of the time upon the water, when domesticated, they will seek water, if it is in reach. The five principal varieties of thoroughbred ducks are the Pekin, Aylesbury, Rouen, Cayuga and Muscovy, each of which has its fanciers. The common duck seems to be a degenerate descendant of the Rouen, which it strikingly resembles in its plumage.

Geese, while not generally prolific, can be more cheaply raised than any other domestic fowl, if supplied with abundant green pastures. Goslings need feeding only a few weeks, during which time it is well to give them soaked bread or boiled potatoes, mixed with meal, allowing them also to run on the grass with the mother goose. If, after two weeks, they have access to tender grass, they will thrive without other food, if they have dry shelter in cool nights.

Artificial incubators of various patterns have been largely introduced. When properly managed they prove very successful, and are useful in that they produce a much greater number of broilers for the table than can be obtained under ordinary methods.

By the United States census reports of 1890 the number of domestic fowls reported for Georgia was as follows: chickens, 7,357,934; turkeys, 148,797; geese, 291,676; ducks, 105,537. The number of eggs produced was 11,522,788 dozen. The pounds of honey produced were 1,757,758, and the pounds of wax, 49,935.

In France and some portions of England, it is customary for the ladies of the household to take charge of the poultry. This custom prevails on some of the farms in our State, and it would be well if it were more universal. A writer quoted in the *American Farmer* has well said:

"We can assure the ladies that in this specialty there is great scope for the exercise of the esthetic perceptions. What can be more beautiful, for instance, than the penciling of the gold and silver Hamburgs; the exquisite harmony of color which the best-bred gray Dorking pullets exhibit, and which, we think, come nearer the wild game birds of the country in beauty of form and plumage than any other? Then there are the numerous strains of game fowls, the *preux chevaliers* of their race, unexcelled in splendor of plumage and unequalled in grace of form and carriage; the Houdans, helmeted like cuisassiers, and the plumed Crèveœurs, the *black horse cavalry* of the poultry yard; the La Fleche with its branching antlers, and the Black Spanish and Leghorns with battlemented combs of the brightest crimson, flaming above the raven and snow of their plumage, entitle them to be considered the *color guard* of the grand poultry army. Then there are the stately Brahmas and Cochins, the giants of their race; the Black Polands with their crowns of snow, and their golden and silver cousins beautifully marked; and last come the sprightly little Bantams, whose pencilings have made immortal the name of Sir John Sebright, and whose tints are almost as various as the wild flowers of spring. Is there not a field here sufficient to tempt the most esthetic taste?"

The Goat.—The much abused goat, the delight of the small boy, and the butt of the wit, the animal whose destructive propensities and wonderful digestive powers have furnished many a joke, has his good traits, and with proper management becomes a useful member of the great society of dumb laborers, who spend their days and lay down their lives in the service of man. The farmer who keeps a little flock of them, shut in upon a suitable range, will, when he wishes to make merry with his friends, find no richer feast for them than the well-prepared flesh of a tender kid. To those who keep even the common goat in large numbers, there is a good source of profit in their skins. There is a steadily increasing annual importation into the United States of goatskins for necessary use in home manufactures. The invoice value of these imports was in 1898 \$15,500,000, and the market value probably over \$25,500,000. The production in the United States is comparatively none. And yet there are in all the States of the West and South large areas of unimproved land which could be well employed in the feeding of goats for a profit. Through much of the area are mountain chains, and these are the favorite pasture ranges of the goat. If all the goats in the United States were kept with the single object of supplying skins for the market, they would fail to supply a small fraction of the present demand, and at the same time remain at their present number. Estimating four pounds to

ANDREA GONIN



the skin, which is about the average weight of dry skins, it would require the slaughter of 16,261,621 goats and kids to yield the skins imported during 1898.

A large proportion of our stock of common goats is kept in the suburbs of cities. In the West many of them are kept with sheep as a protection against dogs, wolves and coyotes; while the increasing flocks of Angoras are kept chiefly for their yield of mohair.

The goat thrives in all climates outside of the polar regions. Hence most of the area of the United States, with the possible exception of Alaska, is favorable to the goat family generally, and much of the Pacific slope, the southwest and the south, is particularly adapted to the long-fleeced varieties, such as the Angora. Mr. J. T. Henderson, Commissioner of Agriculture of Georgia in 1885, in his annual report for that year said: "Experiments in the raising and keeping of the Angora goat in these mountain pastures are making a very favorable impression. It is thought with some reason, that this particular branch of stock raising may be easily carried to a very large and important development in our mountain counties. The adaptedness of this locality to the raising and support of the Angora has been so marked that those accustomed to the care of this valuable animal are sanguine that we shall see in the near future a very important source of profit in this branch of industry. . . . It is hardly possible that the native habitat of the Angora is better adapted to its keep and development than are the mountain counties of this State." In 1878 Colonel Richard Peters, of Atlanta, wrote to Mr. John L. Hayes:

"In this connection I may say a few words about the Angora goat, very improperly termed the 'Cashmere.' I have owned these animals from six different importations, those brought over by Dr. J. B. Davis in 1848, proving to be superior in many respects to any of the more recent importations. One of the most valuable, interesting and remarkable traits of the Angora is the rapidity with which fleece-bearing goats can be obtained by using thoroughbred bucks to cross on the common short-haired ewe goats of the country.

I have had great success with the Angoras and regard them as one of the most valuable acquisitions to the resources of our husbandry. They have yielded me more substantial pecuniary profit than any other of my extended stock investments."

Mr. J. W. Watts of Laurens county, South Carolina, in a letter to Mr. Hayes in December, 1877, said:

"Even here, seventy-five miles from the mountains, I have for six years grown most successfully the Angora goat, whose flesh I regard as

superior to any mutton, and whose fleece properly handled could there (in the Blue Ridge Mountain region) be made more profitable than any wool-growing. In a cross I have made with a pure Angora buck and a Maltese ewe goat, I have raised a ewe goat that will give four quarts per day of as good milk as any cow on my plantation. The feed of one of my cows will keep twelve goats. My cows must have certain food or they will not thrive. My goats will eat anything, almost, and do well; and with this advantage also, that their milk and butter are not in any way affected by their diet.

The ease with which they can be kept, feeding as they do on weeds, briars and other coarse herbage, fits them for sections where sheep cannot be raised to advantage. Their readiness and ability to defend themselves against dogs is greatly in their favor. A flock of valuable wool-bearing goats can be raised in a few years by using thoroughbred bucks.

If it be desired to raise these animals for profit, much might be derived from the sale of the skins, for which there is such heavy demand in the United States. There is also a good market value for their flesh, tallow, bones, hoofs and horns. The females, which always constitute the larger portion of the flock, possess considerable value also in milk for household uses, or which can be converted into the most salable cheese, similar and equal to the Roquefort, Mont d'Or, Le Sassenage and Levroux, so highly esteemed in France and Switzerland.

Herded goats, under suitable conditions, whether for skin, fleece or by-products, will pay a good profit on the investment.

SPECIAL INFORMATION CONCERNING THE ANGORA GOAT.

In view of the many inquiries that have come to the Department of Agriculture concerning Angora goats, it has been considered best to give some special information on this subject.

The first importation of Angoras into the United States was from Turkey in 1848, by Dr. James B. Davis of South Carolina, who two years before had been appointed by President Polk to visit that country in response to a request from the Turkish government for the president to send a man to them who understood cotton culture. On the return of Dr. Davis to the United States, he brought with him nine Angora goats. Colonel Richard Peters of Atlanta, Georgia, secured two pair of these. By the year 1854 he had crossed his thoroughbred bucks and the common does, and was so well pleased that he visited the farm of Dr. Davis in South Carolina and purchased the remainder of the importa-

tion with its increase. "These," says Mr. C. P. Bailey, the great Angora farmer of California, "were the only Angoras imported into the United States up to 1866." In that year Mr. W. W. Chenery of Boston, Massachusetts, secured a shipment from Turkey and sent seven head to California, one of which died on the way. Two of the remaining six were purchased by Mr. C. P. Bailey of San Jose, California, at five hundred dollars a head, and this was the first importation into California of thoroughbred Angora goats.

By two subsequent importations in 1869, by Israel Diehl, United States Minister to Turkey and Charles S. Brown of Ohio, and in 1876 by Messrs. Hall and Harris, Mr. Bailey has added to his original purchase, and now from their descendants has a flock which runs up into the thousands. His great success in the raising of Angoras makes him authority on this subject, and we are glad to avail ourselves of his knowledge and experience, as given in a little pamphlet on "California Angoras."

One of the principal features of the Angora business is the Mohair, whose handling and care is therefore of prime importance.

In the first place, special care must be given to the time and methods of shearing. A general rule is to shear as early in the spring as is safe, because the earlier the mohair can be taken off without too much risk from storms, the better it is for the fleeces, as they are more oily and lustrous before the animal begins to shed. Where there is any danger of snows and storms late in the spring, the first of April is early enough for the shearing, which should be done early enough to save the hair.

If inclement weather, with cold rains or sleet, should follow the shearing, the animals must be carefully protected for a while. The ewes especially must be sheltered, for, if they should become thoroughly chilled, they would be liable to drop their young before the time. Sheds should be provided for them for shelter during storms or cold nights. These sheds need not be very elaborate, for, if left partially open, they will dry quicker after a wet storm.

Mr. Bailey thinks it better to shear but once a year, since one long fleece pays better than two short clips. However, it is the common practice to shear twice a year in California, the first of September and the first of April. Care should be taken not to make two cuts in the hair, the short or second cut being entirely worthless and very undesirable at the mills. Start the shearing at the top of the neck where the hair divides and continue down the side of the neck, keeping the fleece intact. This will prevent the cutting in two of the long locks on the side of the

neck. Rough handling must be avoided, especially of the ewes, which are very tender at shearing time.

As soon as knives shall have been made that will shear Angoras as well as they do sheep, and will not clog with the mohair, machine shearing will be as popular with the goat men as it is now with those who handle sheep. The great advantage of machine shears over hand shears is that they shear clean and smooth, without cutting the hair twice or injuring the goat's skin.

After the fleece is entirely off and the wool on the face and legs clipped, spread the hair out on the floor and cut off all tags. Then the fleece should be turned with the outside out and tied with good sewing twine—not the ordinary wool twine.

The kid hair should be kept separate, for it always brings the best price. Care should be taken that there may be no straw or dirt in the sack in which the wool is packed. The hair, after reaching the mills is cleaned and made into various fabrics, being often mixed with wool or cotton.

The most common articles of mohair manufacture are plushes, such as are used for upholstering furniture, for ladies' dress goods, figured cloth, braids, rugs, robes, and ornamental furnishings. American grown mohair finds a ready market in New York and Boston, and is manufactured largely in Massachusetts and Maine.

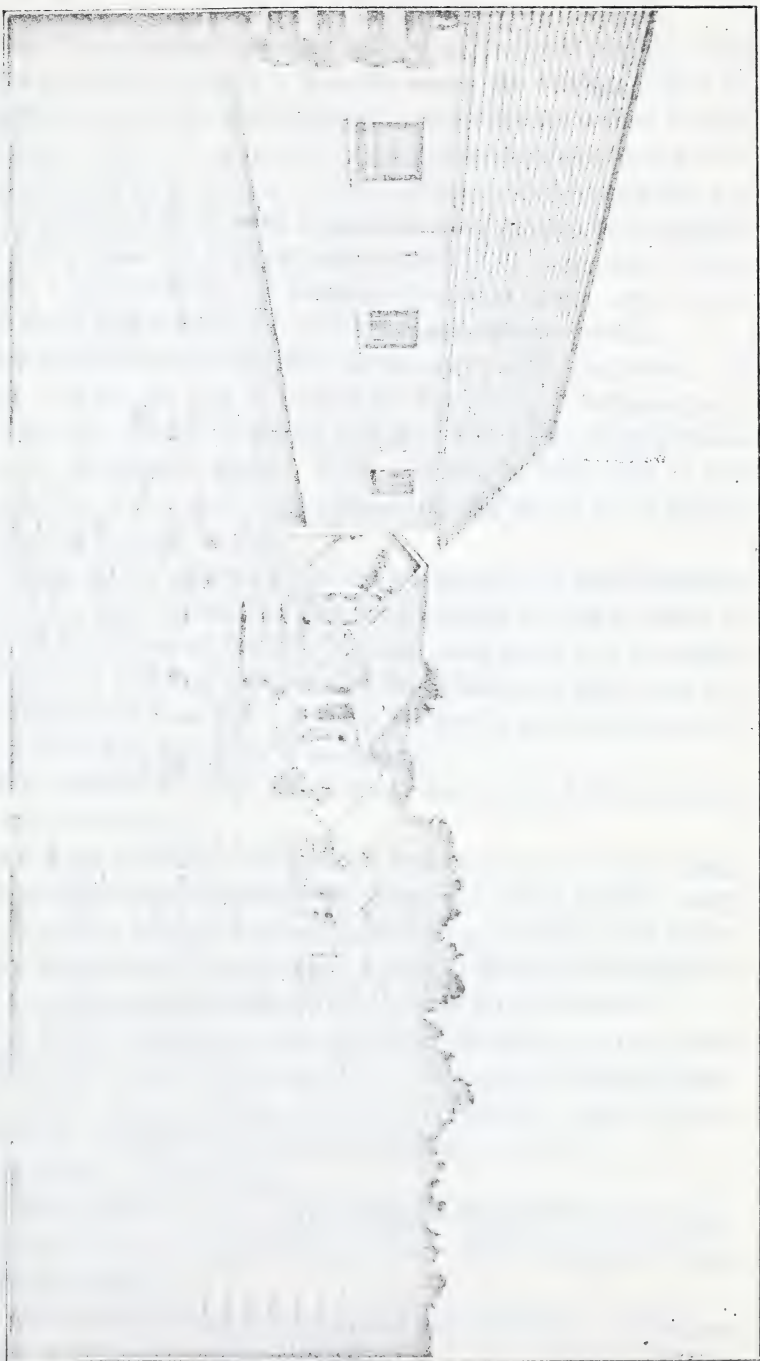
The price of mohair depends upon its fineness and length. The purer-bred the goat is, the finer its hair will be and the better price will it command.

The skin of the goat is also the basis for quite an industry. Leather skins are obtained chiefly from the common goat. Large numbers of common goat skins are imported into the United States annually, and according to Mr. Barnes of the United States Department of Agriculture the value of the importation for 1900 was \$25,000,000. The Vici kid, so popular for shoes, is made from the common goat skin, as is also a fine grade of glove leather.

The skin of the Angora is used for rugs, robes and trimmings. It must be taken off properly and stretched in the shade to dry, or else it should be well salted. The skin should not be allowed to lap over on the flesh side, because it is likely to heat. They should never be thrown in a pile, for the hair will slip, if left for only a few hours, and then the skins are worthless for robes. The hair on the skin should be kept as clean as possible. Shearing skins are classed with common goat skins, and skins of very young kids are of no value.

The best time to take the skin is in the fall, when the goat is fat and

HORSES AND YARDS FOR BERNSHED HOON, PLIMONT FARM, SMYRNA, GA.



has seven or eight months growth of hair. Hair at this time will be much more lustrous and will shake out more readily than after a longer growth.

The meat of the Angora resembles mutton so closely that it is sold in the markets as mutton, though it is really more like venison. The fat of the Angora is more evenly distributed through the meat than in mutton. The goats usually slaughtered are wethers four years old and over.

In clearing brush land there is no more effective worker than the Angora, but he must not be allowed to get into your garden or your field.

A good fence, three feet high, is amply sufficient to hold goats. Three boards, with two barb-wires, or a twenty-four-inch Page woven wire fence, with three barb-wires above will keep them within bounds.

The kidding season is the busy time of the year on the goat ranch. If the weather is good, the task of caring for the young is comparatively easy; but when the weather is stormy and the lands muddy, considerable attention must be given to them. With a bunch of from fifty to two hundred and fifty, and a shed large enough for the entire lot, it is easy to raise a large percentage of kids.

The kids must not be allowed to go out too young, and after birth the kid must be kept with the mother goat long enough for her to know it. If it be found that some of the kids are not being cared for, does, that apparently are not suckling kids, should be caught and held until the unnourished kids have been fed. After a kid gets a good start, he will steal a living from different ewes, if necessary.

Large sized Angora skins are worth from one to two dollars, according to size and condition.

Half breed goats scarcely yield enough hair to pay for the shearing; three-quarters bred goats shear from one to one and a half pounds, worth from 15 to 20 cents a pounds; seven-eighths bred goats shear from two to three pounds, worth from 20 to 30 cents a pound; fifteen-sixteenths bred goats shear from three to five pounds, worth from 30 to 45 cents.

Mr. Bailey adds: "the fourth cross, or fifteen-sixteenths, is the lowest grade I would keep exclusively for mohair. The average fleece of pure-bred goats is from four to six pounds; but, frequently, eight and ten pounds have been obtained from choice, well-kept animals."

Goats require less care than sheep.

Shearing must be done as soon in the spring as the hair begins to shed. Otherwise the oil in the hair goes into the body of the animal and loses its life, lustre and weight.

Young Angora does produce the finest and heaviest fleeces. They are in their prime at from two to six years old.

Will Angoras pay? Mr. Bailey answers the question thus:

Cost of 1,000 fifteen-sixteenth grade does	\$5,000
Cost of 20 thoroughbred bucks	500
	<hr/>
	\$5,500
4,000 pounds of mohair will bring	\$1,200
800 kids	2,000
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Total value received	\$3,200
Expenses—Herder, one year	\$420
Extra help at kidding	50
Shearing expenses	50
Taxes and incidentals	80
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Total expenses	— \$630
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Balance, net gain	\$2,570

This is over 46 per cent. on the investment."

In September, 1898, the number of Angora goats in the United States was estimated at 247,000. Texas headed the list with 75,000. Of thirty-two States Georgia came fourteenth with 750. Of common goats the number is not given. The number of all kinds for the whole country was estimated at 500,000. The whole number of goats of every kind in Georgia, kept in barns and inclosures, not on farms or ranges was 2,045 according to the census of 1900.

THE HORSE.

No domestic animal is more intimately associated with man than the horse. As far back as we have any record he has been man's willing, faithful friend, sharing his perils in war, his toil and hardships in travel long and weary, and his labors in all peaceful pursuits of life.

For whatever purpose a horse is to be used, there are certain characteristics which he should possess, without which his usefulness is greatly impaired. These may be stated as a good disposition, strength, endurance and activity. Beauty of form and color and gracefulness in motion are very desirable, though not absolutely essential; and yet it is better to pay a little bit more for a horse that has an attractive appearance than to purchase an ungainly animal, however useful it may be.

A horse with a bad disposition may, by kind treatment, be greatly changed. Yet he is never safe, for it is impossible to tell when his bad temper will crop out and cause him to do infinite mischief.

There are also among horses, as among men, different degrees of intelligence, a due regard to which is very essential in the selection of a good animal, whether for the saddle, carriage, or general purposes of the farm. An intelligent horse is generally more docile, and is safer, because less liable to become frightened.

Strength and endurance are indispensable qualities, and these depend more upon form and muscular development than upon size. Of course these things being equal, the larger the horse is, the stronger the animal. Regular hours for labor and rest will greatly increase the power of the animal for endurance.

On farms where several horses are kept for work, and a special one for the carriage, the heavier draft animal is better suited for the heavy work. But the larger class of farmers can keep only one or two horses. For such, an animal of medium size is the more desirable.

We can not discuss here the points of a horse. Experienced dealers know them well, and a man of little knowledge about these things should, in purchasing, get the assistance of some one who understands such matters.

The diseases of horses are numerous, and in many instances arise from bad management—an improper system of feeding, ill-constructed or poorly ventilated stables, injudicious driving or neglect of proper cleaning. When diseases do occur, quacks should be avoided. Diseased horses should be treated by those who understand their ailments and the remedies for them. Intelligent management will tend greatly to prevent disease, if the animal comes of good, healthy stock.

The number of horses in Georgia on January 1, 1900, was 109,905, valued at \$6,001,626. The number kept in barns and inclosures and not on farms was 21,016, by the United States census of 1900.

This noble animal, the faithful servant of man, deserves at all times the kindest consideration. Careful and sufficient feeding, protection against inclement weather, rough treatment and overwork will increase his usefulness and prolong his days. Georgia possesses every requisite for the raising of the finest breeds of horses for the saddle, the carriage or the work of the farm.

MULES.

For farm use and all kinds of heavy work the mule excels all other animals. He is admirably adapted to work in hot weather, such as would be too severe for the horse or the ox. Therefore he is a favorite in the Southern States. The mule is longer-lived and more hardy than

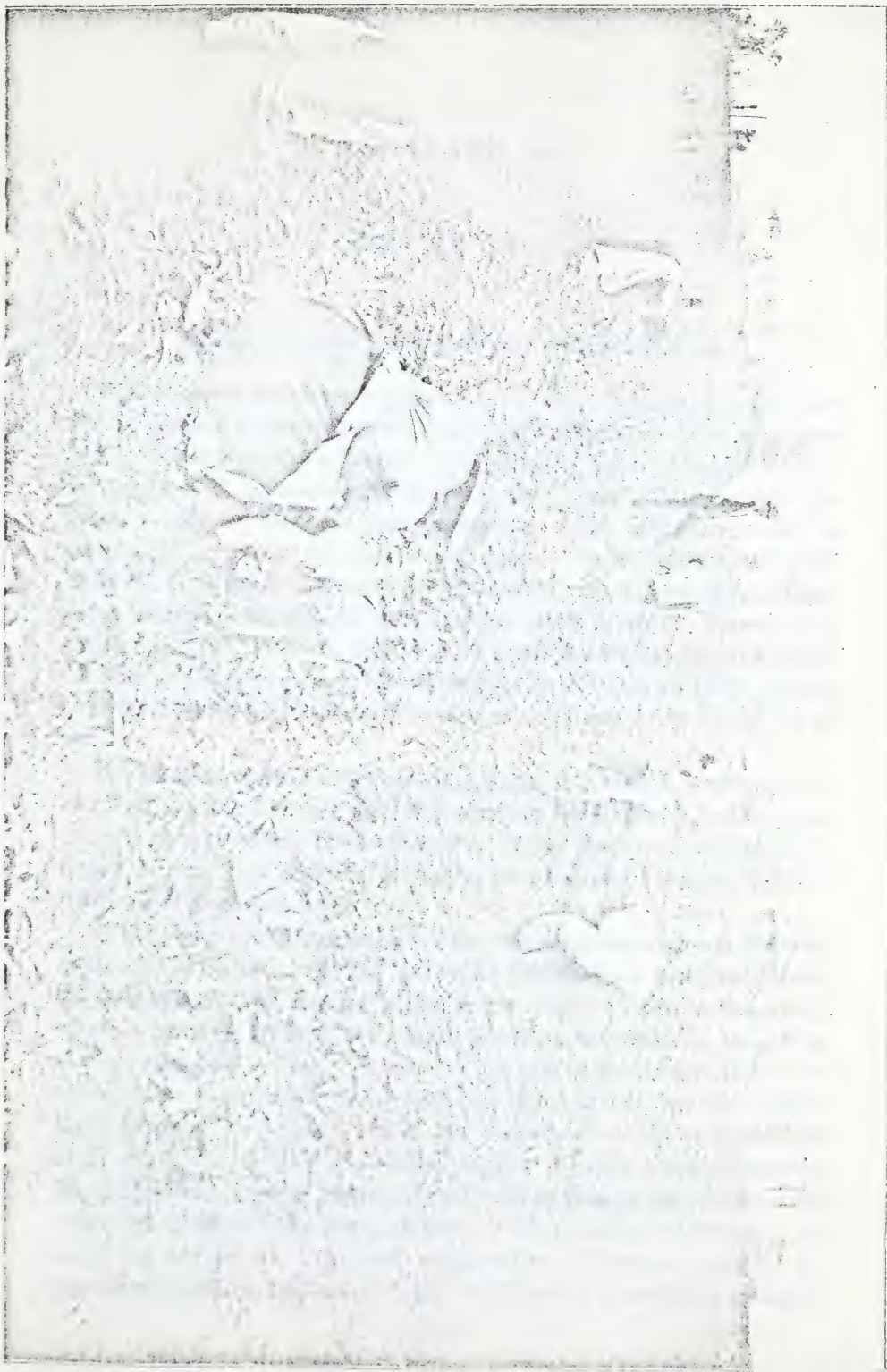
the horse. He can work for a much longer period, and will thrive with less care, is not subject to as many diseases and, when sick, is more easily cured. A well-bred mule will, with the same amount of attention, outlast two horses. He is not so easily frightened and therefore not so apt to run away as a horse. He is more steady in his draught and less likely to waste his strength. Having a tough skin he is not so much annoyed by flies. The expense of shoeing a mule is only about one third of that required for shoeing a horse, because his hoof is harder and more horny and so slow in its growth, that shoes do not need removal, and will hold on until worn out.

Although they will thrive on fare coarser and much less in quantity than that of horses, yet it is economy in their case and in that of all stock to give them plenty of good food without overfeeding them.

The largest, strongest and best mules are the offspring of improved blooded mares, having as their sire a jack, active and spirited and not less than fifteen hands high.

Mules are too often neglected and abused, and frequently become stubborn from mere self-defense. They are naturally affectionate and patient, and if treated kindly, will be docile and obedient.

The number of mules in Georgia on the first of January, 1900, was 157,008, valued at \$10,826,032. The number kept in barns and inclosures and not on farms was 7,540, according to the census of 1900.



PICKING STRAWBERRIES.

CHAPTER X.

FLORTICULTURE.

SEED FARMS, IRRIGATION, TERRACING.

While flowers and flowering plants have been cultivated in hot-houses and in gardens from the colonial days until now, and while they have been grown for sale to a limited extent for the last one hundred years, the business of the commercial florist in the United States has been developed only within the past thirty-five years and has made its most rapid strides in the last twenty years. In the vicinity of great cities the total value of florists' establishments runs up into the millions, going as high as \$9,254,873 in New York State in 1890. New Jersey, situated between the great cities of New York and Philadelphia, reported for such establishments a valuation of over \$3,600,000 in 1890, making the best showing in this line of business of any State in the Union for its size.

The trade in flowers and flowering plants in Georgia was valued at \$81,932 in 1890, showing that floriculture is beginning to be important enough, to rank as one of the industries of our State. As our cities increase in size, this beautiful business, so congenial to esthetic tastes, will expand more and more.

Of the plants sold the demand for the various kinds varies in different sections of the Union. In the South the favorites are roses, carnations, chrysanthemums, geraniums, palms and pansies. There is also everywhere a growing demand for aquatic plants, and specialists are giving marked attention to them. Regarding the sale of cut flowers the census reports showed that roses were in greatest demand, and that close behind them followed carnations. These two furnished 65 per cent. in value of all cut flowers sold in the United States. Violets, chrysanthemums, lilies, hyacinths, smilax, bouvardia, heliotropes, pansies and tulips in the order named supplied 25 per cent. more, while the other 10 per cent. was made up of orchids, tuberose, mignonettes, primroses, camelias (or japonicas), daffodils and many others, cultivated in a small way to supply

some special or local demand. For instance the beautiful camelia japonica, which came in far down on the list in the United States census reports, is decidedly the fall and winter favorite in Augusta and Savannah, blooming in the open air in midwinter in the latter city.

In Georgia there were reported twenty-six florists' establishments, five of which were owned and managed by women. The largest number of square feet of glass reported for the hothouse of one establishment was 15,000 and the smallest 750. The total number of square feet of glass reported in the whole State was 99,918. The number of acres in Georgia devoted to this business in 1890 was 106. In the District of Columbia, where the largest establishment reported 150,000 square feet of glass and the smallest 1,440, with a valuation for all establishments of more than a half million dollars, only 61 acres were cultivated. By far the greatest growth of this business in Georgia was between 1880 and 1890.

SEED FARMS.

In early times families saved the seed from their annual productions, in most cases from whatever remained over from the farm. In some cases careful selection was made, and purer and better seeds obtained, which not only furnished the home supply, but were willingly given to friends and neighbors, who, in return, supplied any seed of their own that might be considered of superior quality. This same practice continues in many communities. The general growth of the country, the rapid increase of population in cities and towns, which led to the establishment of market gardens, the demand for choice seeds and the difficulty of procuring them led the market gardeners or truck farmers to grow and save them, at first for their own use, and later to supply the increasing demand, until finally some of them drifted into the production and sale of seed as a distinct business. The first regular seed farm in the United States, of which there is any report, was established in connection with the nursery business in Philadelphia in 1787. This branch of horticulture was not made a subject of census inquiry until 1890. Of the 596 seed farms in the United States reported at that time, 258, or nearly one-half, were in the North Atlantic Division, the original center of seed production. In the South Atlantic Division there were 89 seed farms, of which 31 were in Georgia and 46 in Florida. The 31 seed farms of Georgia embraced 2,627 acres with a total valuation for farms, implements and buildings of \$177,000, while the 46 seed farms of Florida embraced only 760 acres, with a total valuation for farms, implements and buildings of \$62,333. Of those in Georgia which reported date of

establishment, twenty-two were established between 1880 and 1890. Of those in the North Atlantic Division 13 dated back to the decade between 1830 and 1840, and five to even an earlier period. The first one reported in Georgia was in the decade between 1870 and 1880. So as far as our State is concerned, it is a decidedly new industry, which, between 1880 and 1890, showed a very rapid growth. It is believed that the census report of 1900 will show a large increase in the number of seed farms in Georgia.

The census report for 1890 said: "While this report shows the extent and production of the seed farms proper, the total amount of garden seed produced in the United States is considerably in excess of the amount here given. . . . Again, while the greater amount of seed grains, cotton and tobacco used upon farms is of home production and is freely exchanged for labor or for other products, there are in nearly every county successful farmers who, by a careful selection of seed stock and by better methods, secure greater returns than their neighbors, and are able to dispose of part of their production for seed purposes at advanced rates. These men cannot be classed as seed farmers, and would hardly be able to estimate what proportion of their crops is sold for seed purposes annually; but it is safe to assume that such farmers produce one-third of all the small grains, corn, potatoes, tobacco and cotton seed planted."

IRRIGATION.

One of the most pressing needs of Georgia is irrigation, both surface and underground. How many a time have the agricultural interests of our State suffered from a drought, that has blasted the brightest prospects of a once promising crop! How many a time has the farmer's heart throbbed with anxiety as the sun scorched his fields, while he longed for a favorable season and sighed for the rain that would not come! Irrigation is not only a preventive of drought, but enables the farmer to control the supply of water and to furnish it to the plant at the right time and in the right quantity. This question concerns also the drainage of the land and the preservation of the forests.

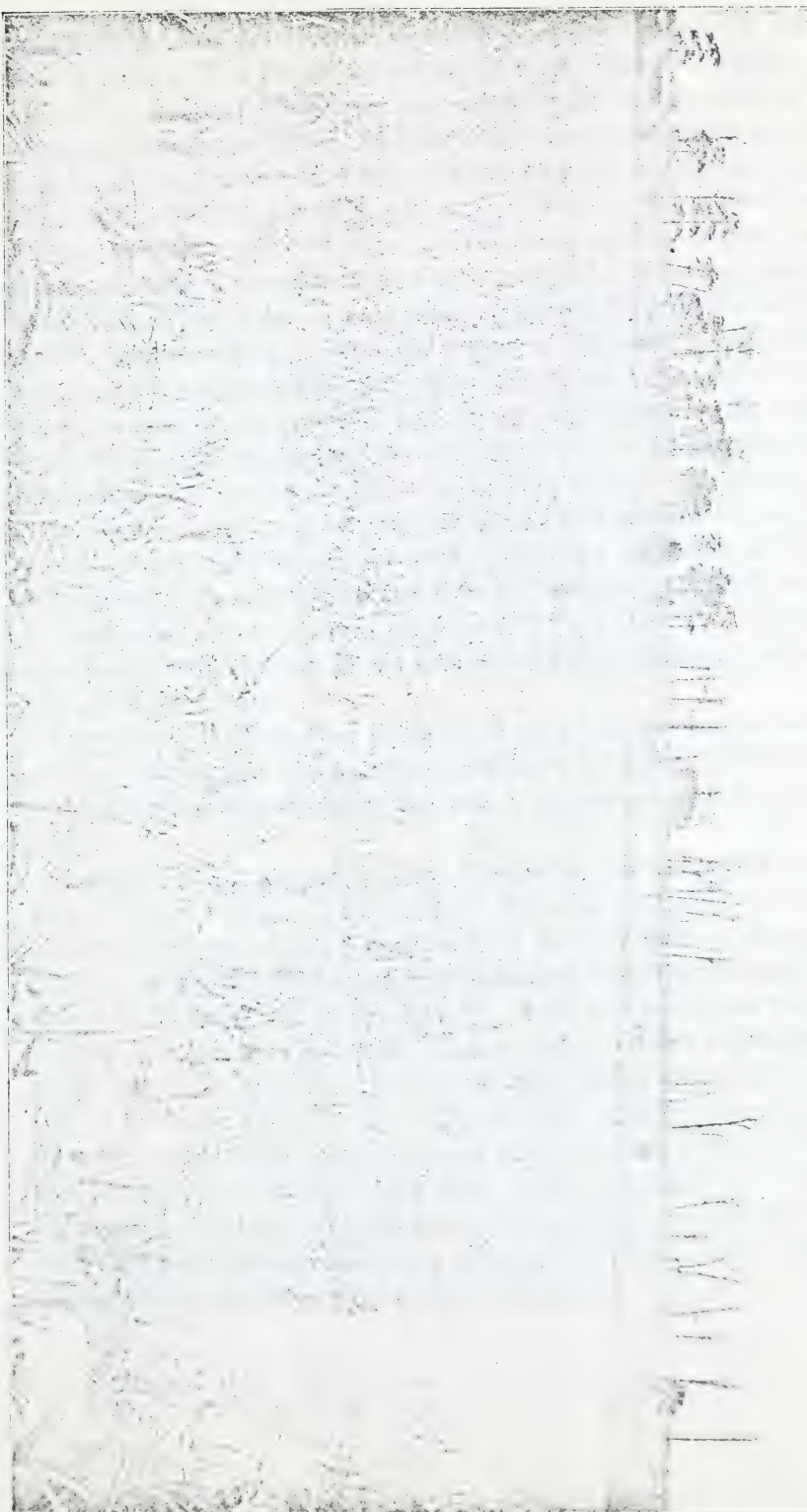
In the vast arid stretches which are found in the States west of the Mississippi river, and where farming without irrigation is impossible, men learn the business thoroughly. But this is intensive farming, a method in which success can be attained only by thorough tilling and careful attention to details. Although one man cannot look after so much land as under the old method, yet he soon learns that he can make

larger profits by carefully tilling a small area than by diffusing his efforts over a larger one. Where a small measure of success can be attained by the careless tillage of many acres of moderate fertility, farmers are apt to go on in the old way, trusting to the weather, getting a good crop if the seasons are favorable, and in a year of drouth, hoping that the next one will be better. Then, if disappointed again, they wonder why Providence is so unkind, forgetting that they have at their command an agent that will enable them to overcome the ills of which they complain. In some sections of Texas where the rainfall is inadequate, it is customary on irrigated fields to make at least a bale of cotton to the acre, while the average on unirrigated lands of the same soil is hardly more than one-fourth of a bale to the acre. A large part of Idaho is so deficient in rainfall, that the country looks like an arid waste. But right in the midst of a desert, that appears to be fit for nothing, and looks as though it can never be made to produce anything, the traveler will come to an orchard of apples, prunes or peaches, each limb loaded almost to breaking with luscious fruit. Perhaps only three years ago this noble orchard was part of the all-surrounding sage-brush desert. What wrought the wondrous change? Irrigation, a scientific expedient, of which for three thousand years man's skill has made use to overcome the unequal distribution of nature's gifts. Some mountain stream near the foothills has been dammed, a great reservoir built, and a huge ditch, carrying millions of feet of water, has been led across the country and its water distributed at the points where needed. The difficulties in the way of successful irrigation are nothing like so great in Georgia. From our numerous creeks and rivers, by proper machinery, the water can be conveyed and distributed wherever needed. Sometimes artesian wells can be used for this purpose, irrigating the land through a system of ditches or storage tanks. Windmills can also be used for pumping up water from wells and distributing it over a garden or field.

TERRACING.

The fertility of broken or rolling lands is greatly enhanced by strict attention to levels or horizontals in their cultivation. As the population of the State increases, the old system of large plantations, on which exhausted lands could be turned out to rest, and new ones with soil yet virgin brought under cultivation, becomes more and more impracticable. Smaller farms become a necessity, as more people come in to take up the land, and the importance of devising plans, by which the fertility of all lands may be preserved, becomes yearly more apparent.

ONION FIELD.



Especially in river bottoms the exhausting process takes from the absorbing capacity of the land and renders it more liable to overflow. Instructed by repeated disasters in the bottom lands, and in those of the Savannah river in particular, by which for three consecutive years the farmers of Georgia were sent West for their corn, a few pioneers began as far back as 1885 to put their land under a more or less perfect system of level cultivation, and four years later the terrace reform began in earnest all over Middle Georgia. As to proper methods of terracing, complete instructions, which meet all cases, cannot be given. To one who has never tried it, but who wishes to adopt this system, a visit to some well-terraced farm, with its unbroken horizontal lines well sodded in grass for the purpose of conserving the rainfall, would be an object-lesson easily comprehended and worth more practically than the study, or blind following of instructions that can be only general in their nature. If breaks occur in any of the terraces, a good practical farmer who watches his fields and soon discovers whatever may be needed, can take his hands to the spot and with an hour or two's work, repair the damage. On land properly terraced, after a heavy rainfall, each water furrow is covered with a fine impalpable powder similar to the rich alluvial deposits found on bottom lands from back water.

Commercial fertilizers are soluble and as a rule are put in near the surface. Hence they are made more effective by being protected from washing and leaching rainfalls; and such is the case on land properly terraced.

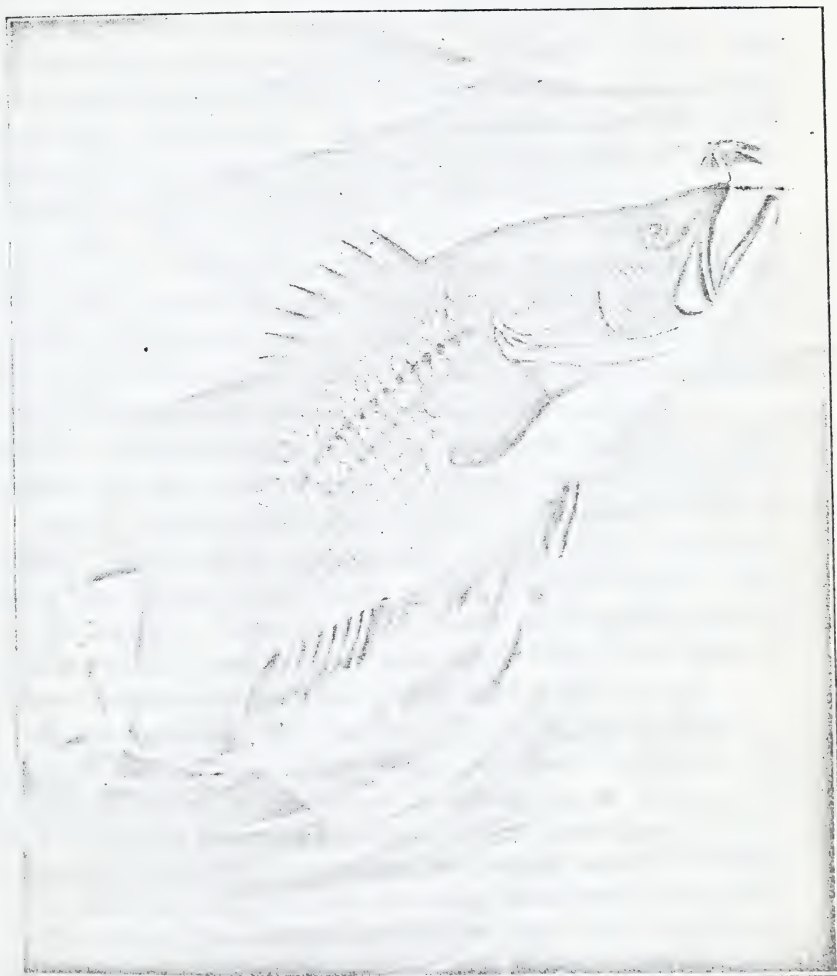
There are in every country solid, substantial and successful farmers, some of whom living on their ancestral domains, soon after the close of the great civil war adjusted themselves to the new order of things, and studying carefully the changed conditions and their requirements, went diligently to work, and by intelligence, thrift and enterprise won back fortunes that had been lost in the clash of arms. Others beginning with scanty means, by careful cultivation of small farms, using the most approved methods, have, by the fruits of their industry, purchased the worn-out lands of their neighbors, and under the best system of intensified farming, have brought them back to life and fertility. These are the men who set the pace for others less enterprising, and may be counted on for irrigation, terracing and any other advanced movement calculated to promote the agricultural progress of Georgia.

CHAPTER XI.

FISH AND GAME.

In almost every county of Georgia are streams whose waters abound in many kinds of fish. Its rivers, creeks, lagoons and ponds give yearly contributions from the finny tribes to reward the labors of the professional fisherman with net or seine, or to repay the patience of the youthful anglers who with rod and line, go forth on holidays to ensnare with worm or fly the unsuspecting fish. In the mountain streams sport the speckled trout. On the Savannah, the Ogeechee and the Altamaha, shad are caught and sold in the markets of Augusta, Savannah and Brunswick. The little town of Darien, near the mouth of the Altamaha, carries on a considerable trade in shad. On the sounds and inlets that flow between the mainland and the numerous islands that fringe the Georgia coast the fishermen's boats are continually busy gathering for the home market or for shipment several varieties of salt fish, besides oysters, shrimps, crabs and lobsters. In the waters of Okefinokee Swamp abound black bass, bream, perch and many other varieties.

In commercial fisheries Georgia did not rank high in the census of 1890, simply because the products of the fisheries had been almost entirely consumed in supplying the home demand. By the census of 1890 the inland fisheries of Georgia were reported as employing 69 persons with a total investment of \$7,859 for boats and minor apparatus. The annual products were 93,480 pounds of fish, valued at \$7,829. All these figures were considerably below the reality. The fisheries along the coast are classified in the United States census under the head of the "Atlantic and Gulf Boat Fishery," and embrace the fishing along the coast in boats. It is so called to distinguish it from that at sea, requiring vessels large enough for registry, that is of five tons burden, or more. The fish are generally sold at once to consumers with only enough of care and labor to insure their delivery. A large proportion of the fishermen are negroes, who equip themselves in the most inexpensive manner, their boats being often so simply made as to have a merely nominal value. The census report declares that "there is such irregularity in their employment, that the return of the number thus engaged is es-



By Permission.

BLACK BASS.

From a painting by Hal Morrison of Atlanta, Ga.

pecially unsatisfactory. Of the "Atlantic Boat Fishery," reports were made of only ten of the States leading in this industry. Georgia was not one of these.

Since 1893 there has been an immense increase in the fishery business on the Georgia coast.

From 1888 to 1891 several oyster canneries were started, but all failed from lack of experience. In the winter of 1893 and 1894 Mr. August Oemler reopened his canning establishment on Wilmington island. His business has steadily grown, and for each of the last two winters his cannery has packed 1,400,000 cans. His establishment employs 24 sailing crafts of from eight to thirty-two tons burden, also three tugs with seven barges, besides numerous small crafts of from thirty to one hundred bushels capacity. There are three other canneries in operation in the vicinity of Savannah. These are: Vam & Byrd, Thunderbolt; George W. Lowden, Thunderbolt; Rosedue Cannery Co., Coffee Bluff. These three establishments put up during the winter of 1899-1900, 1,150,000 cans. Between, 1,500 and 2,000 persons in Chatham county are engaged in this trade, which amounts to many thousand dollars annually.

Brunswick, in Glynn county, favorably located on Oglethorpe Bay, and in importance the second seaport of Georgia, enjoys a fine reputation for oysters. Those shipped from that market are considered of superior quality. One canning company puts up for a New York wholesale house a special brand which is said to bring the highest price of any oyster on the market. There are in the vicinity of Brunswick not less than 50,000 acres of natural beds, of which 25,000 have been taken up and cultivated to some extent. These yield a large and fine oyster.

There are fine oyster-beds also contiguous to Darien and St Mary's.

Considerable interest has already been awakened throughout the United States in regard to fish culture in private ponds. This culture is attended with slight labor and expense. Almost every farm has some stream or pond, that could be so utilized, or at least land of a swampy nature, that could be made valuable by being transformed into a fishpond. In this country fish culture has until late years received comparatively little attention. The artificial propagation of fish among the civilized nations of the earth is a new science. Yet it has been long practiced by some of the heathen nations, especially by China and Japan, who, for thousands of years, have sustained, to a large extent, their dense populations upon fish, a large proportion of which was artificially propagated. To France belongs the honor of originating fish culture in the manner now practiced among civilized nations. With such marked results were their efforts attended, that other European nations promptly followed their example.

On many Georgia farms the carp pond has been introduced as one of the features. It would be well to introduce ponds stocked with these or other kinds of fish, wherever nature has not already supplied them.

There are many varieties of fish in the United States. It would be well to stock our Georgia ponds and streams with them, wherever for any cause the supply is running short.

We append the report of the Fish Commissioner for 1900.

REPORT OF FISH COMMISSIONER.

Hon. O. B. Stevens, Commissioner of Agriculture for Georgia:

Sir:—In conformity to your request, I have the honor to submit my annual report as Superintendent of Fisheries for the State of Georgia, for the fiscal year ending September 30, 1900.

During the period covered by this report there has been a marked improvement in the observance of the laws pertaining to fish throughout the State. The distribution of the booklet, "Georgia Fish Laws," over the State and the work of the Fish Wardens, has resulted in the accomplishment to a large measure of the end desired. During this year the violations of these laws have been less than any former year. This is especially noticeable in the inland counties. The number of fish has noticeably increased. The abundance has been remarked on by citizens throughout the State. More fish have been used and sold, both on the coast and inland, than for years past.

The following statistics taken from the latest authority are given to show the amount involved and interested in the fisheries:

"In 1897, 1,869 persons were engaged in the fisheries of Georgia—159 in the vessel fisheries, 1,245 boat fishermen, and 465 shoresmen. The investment in the fisheries amounted to \$284,864. Fifty-one vessels were employed, worth, with their outfit, \$28,833, and 680 boats, valued at \$20,277. The apparatus of capture was valued at \$17,898, while the shore property and cash capital amounted to \$217,856.

"The yield of the fisheries of this State was 4,995,100 pounds, worth \$170,605. The most important items in the fisheries of Georgia are oysters, the yield being valued at \$86,709, and shad, the value of which was \$46,705. The catch of terrapin was valued at \$11,254, and sturgeon at \$4,060. The value of products, when compared with that of 1890, shows an increase of \$47,042."

The Superintendent wishes especially to commend the work done by the Fish Wardens throughout the State. They have shown interest and activity, and have succeeded very effectually in enforcing the laws. The compensation provided for these Wardens by the Code is "one-half of the fines and forfeitures imposed by the court and paid by the violators." Under the construction which has been placed on these words, when they have been construed, the Wardens get nothing when the defendant is sent to the chain-gang in default of paying his fine. This works a manifest injustice. I would recommend that these Wardens be paid the same



THE GEORGIA PARTRIDGE. *By Permission.*
From a painting by Hal Morrison, of Atlanta, Ga.

proportion of the amount realized from the hiring out of a defendant to a chain-gang, where he does not pay the fine, as is given the Warden when the fine is paid. The labor performed by these men in securing the conviction of criminals and the enforcing of the laws makes this just. And the provision should be the same, whether the money comes directly from the payment of the fine or from the hiring out of the defendant.

During this year I have distributed over the State more than one thousand copies of the Georgia Fish Laws. The good which has already resulted from the publishing of this booklet is great and will continue. In many counties the wardens have reported to me that, with the distribution of these laws, violations have practically ceased. An addendum has been prepared giving the public and local laws enacted by the last legislature. I will be glad to furnish upon request either this addendum or the Fish Laws of those wishing. The large demand already made for copies evidences the interest in and appreciation of the publication.

Although no systematic effort has been made to investigate the various streams and lakes stocked with new varieties of fish, this office is in constant receipt of information showing the result of their introduction. The United States has established a fish cultural station at Cold Springs, Bullochville, Ga., and there some of the fishes most suitable to the warm waters of the South Atlantic and Gulf States will be propagated. The results of this, I believe, will be most gratifying.

The expenses of this department from October 1st, 1899, to October 1st, 1900, have been \$56.34, as shown by the attached itemized statement.

(See Exhibit A.)

Very Respectfully,

A. T. DALLIS,

Superintendent of Fisheries, State of Georgia.

GAME.

Game also abounds in almost every part of Georgia. In the mountains and valleys, in fields or wood, lagoon or swamp, or mid the extensive stretches of pine forests are found many kind of birds, the squirrel, hare and opossum. In the proper season the echoes resound with the report of the shotgun, the favorite weapon of those who seek the quail (or partridge), the dove and field lark, or the rice bird of the swamps and marshes.

In favored sections are found the snipe and woodcock, while in others the wild turkey, a nobler game, falls a victim to the hunter's shotgun or rifle. In Northern Georgia or in the woods of the southern portion of the State, stalk the stately deer, which are especially numerous among the islands of Okefinokee Swamp, where also dwell the bear, otter, wild-cat and panther. To the sportsman who does not object to hunting in water and muck, or to carrying his food and blankets on his back, Okefinokee is a paradise of delights. But to him who prefers to hunt amid

pleasanter surroundings, some of the older localities give ample scope for the enjoyment of his favorite pastime.

In Chatham county, which was settled 168 years ago, the deer yet roam the woods, and almost any winter day one can be started on the edge of the Ogeechee swamps. A dozen or more of Savannah's hunters each winter make a specialty of deer-shooting. Every now and then they return from a hunt with a big buck or a fat doe strapped to their buggies. For many generations have men been shooting them, and yet there are many survivors who continue to afford the hunter "lots and loads of fun."

Near Savannah regular hunters follow the dog for quail, or trail up the creeks for duck, or on the islands of the river and along the edges of the rice fields, bring down with unerring aim doves and partridges, snipe and woodcock. In one of the large game preserves below Savannah pheasants have been colonized.

Jekyl, one of the loveliest of Georgia's beautiful sea islands, belongs to a club which has stocked its woods with game and has the exclusive right to hunt on the island or fish in its waters. The owners of this island enjoy beautiful scenery, ocean beaches and charming forest drives.

CHAPTER XII.

MANUFACTURES.

Georgia stands in the front rank of the Southern States in the variety, extent and value of her manufacturing establishments, without considering the question of her leadership in any one particular line. Long before the civil war the prominence of the State in railroad construction and manufactures gained for her the proud title which she still worthily bears, "Empire State of the South." Some of her leading manufacturing enterprises began far back in the thirties and steadily grew in extent and variety. Many of the small industries, such as shops for making brooms, buckets and boxes, were early introduced. The larger ones, such as cotton and woolen factories, iron works, tanneries, saw, flour and grist mills, lumber and planing-mills for making doors, blinds, sashes and almost all descriptions of carpentry, were found in many localities, especially in or near the larger towns. Although agriculture was the leading pursuit, many enterprising men were engaged in manufactures and their number was steadily increasing. Georgia was no laggard in the march of progress, suddenly aroused from long slumber by the rude shock of arms, and taught in the school of adversity to turn her attention to other industries besides those of planting. The thoughts of her wide-awake business men had long been turned to manufactures and commerce, as important collaborators with agriculture in the development of their beloved State, and many of the most influential men of Georgia, some of them planters of large means, were stockholders and directors of cotton and woolen factories, flour, grist and saw-mills. The rattle of looms and whir of spindles were heard in our growing cities and towns. Manufacturing villages sprang up near good water-powers, in solitudes that had never yet been pierced by the whistle of the locomotive. The same spirit, which is making Georgia great to-day, was abroad in the land then. The rapid growth of our cities had already commenced. We see the evidence of this in White's "Historical Collections of Georgia," published in 1854, where we find the following reference to what is now our greatest city: "Atlanta has had a growth unexampled in the history of the South. It is the point at which the Western and Atlantic, the Macon and Western and the Georgia railroads connect." Then Mr. White gives a state-

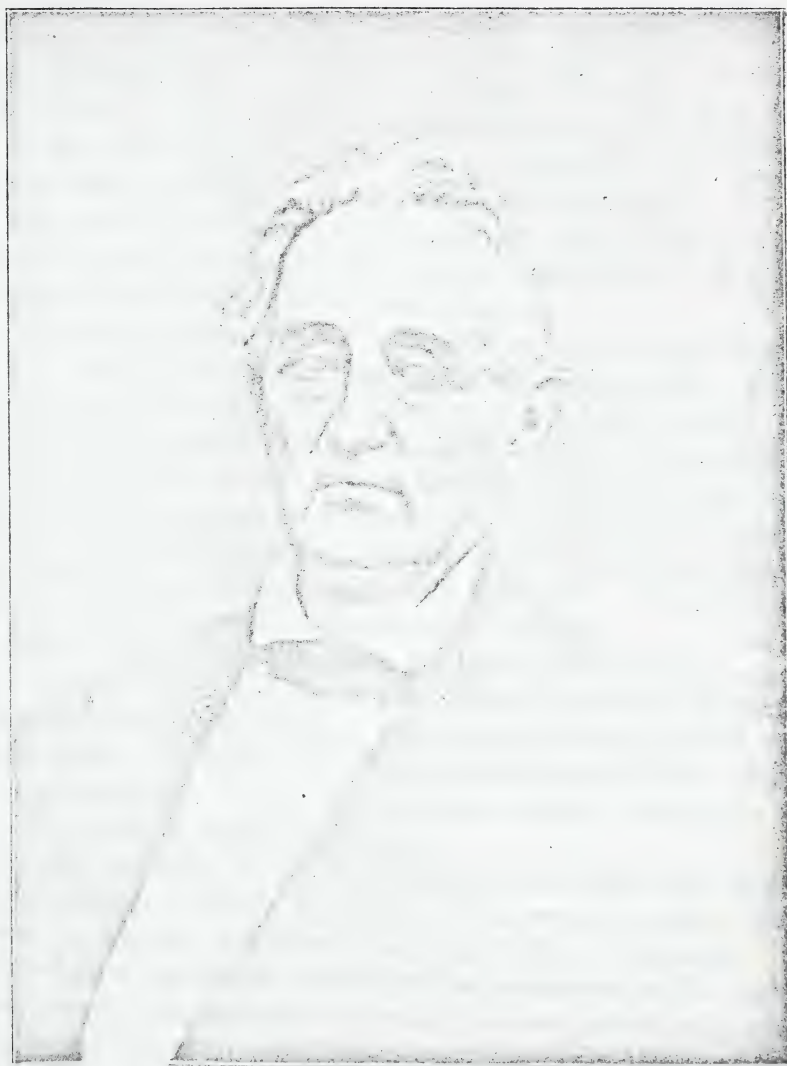
ment from Jonathan Norcross, Esq., a few extracts from which are here given: "Population of Atlanta not precisely known, but placed by none under 4,500 and still increasing. . . . There is in this city one steam flouring-mill, investment \$35,000, the operation of which may be placed at \$150,000 per annum. One iron foundry and machine shop—cash operations \$20,000 per annum. There are three carriage and wheelwright shops, two large tanneries, one large shoemaking establishment, two large tanneries and shoe-establishments in course of construction. In addition to the Georgia Railroad and State machine shops, which employ large numbers of workmen, one car-shop is now going up as a private enterprise—investment \$30,000."

Mr. White then goes on to enumerate "the Winship establishment for making railroad cars, with a capital of \$20,000; the Atlanta Tanning company—proprietors, Alexander and Orme, with a capital of \$20,000—hides handled by machinery, propelled by steam—connected with which establishment were a grist-mill and patent circular saw-mill, lathe and shingle machine; the Atlanta Machine Company turning out \$12,000 worth of work per annum."

The railroads and manufactures which were then laying the foundations of a great city in what a few years before was a wilderness, were the fruits of Georgia enterprise. The same agencies were at that very time putting new life into the older cities, Augusta, Macon, Columbus and Athens. It may be news to some that the period of Atlanta's most wonderful development and most rapid growth was between 1850 and 1860. The child of railroads and manufactures, she grew at a tremendous pace, which no subsequent decade of her history has paralleled, and was an important factor, as she is still, in winning for Georgia a reputation for energy, pluck and enterprise.

In the whole State there were in 1850 1,522 manufacturing establishments, of which 35 were cotton-mills, several of these being also engaged in the production of woolen fabrics for the sole manufacture of which there were three mills. The other establishments were divided among the various manufactures which minister to the needs of every civilized community. The total value of the products of all manufactories was \$7,082,075. The total number of establishments at each succeeding decade is: in 1860, 1,890; in 1870, 3,836; in 1880, 3,593; in 1890, 4,283.

The total value of their products has shown a steady increase, being for 1860, \$16,925,564; for 1870, \$31,196,115; for 1880, \$36,440,948; for 1890, \$68,917,020. In 1880 the 24,875 laborers employed received \$5,266,152 in wages; in 1890 the 56,383 laborers were paid \$17,312,126.



HON. MARK A. COOPER.

A Pioneer in Georgia Manufacturing Enterprises and First President of the Georgia Agricultural Society, the influence of which organization was largely instrumental in the establishment of the State Department of Agriculture.

The material consumed was valued as follows: \$24,143,939 in 1880; \$35,774,480 in 1890.

If the ratio of increase between 1890 and 1900 was as great as that between 1880 and 1890, we would have for the number of all manufacturing establishments in 1900, 5,113; the total value of their products, \$139,509,926; the number of laborers, 187,000; their wages, \$58,861,228; and the value of the material consumed, \$51,552,000.

If the official figures for 1900 can be obtained in time, they will appear in the Appendix; if not, they will be published later.

The growth in the textile industries of the whole Union during the last ten years is remarkable; but the most wonderful part of it is the progress of the South in cotton manufacturing.

According to figures collected by the Boston *Textile World*, the North had, in 1890, 12,721,341 spindles and the South 1,828,982. Now the North has 15,242,554 spindles, while the South has 5,815,429. The increase in the South for the last decade is therefore 217 per cent. and for the North 19.8 per cent. South Carolina comes third in the Union, right after Massachusetts and Rhode Island, with 1,794,657 spindles. North Carolina is fourth with 1,429,540 spindles; New Hampshire fifth with 1,343,923 and Georgia sixth with 1,218,504. Of the Southern States Georgia ranks as third in number of spindles.

Cotton Mills.—In 1827 Augustin S. Clayton, Thomas Moore, Asbury Hull, James Johnson and W. A. Carr, began the erection of the first cotton-mill south of the Potomac, which was also among the first in the United States. In 1833 John White became superintendent of what was then called the Georgia Factory, and to-day his descendants own this mill, known as White's Factory.

By 1852 two mills, which long outranked all others in the State in size and product, had been constructed. One was the Augusta Cotton Factory at Augusta, the other, the Eagle Mills of Columbus. The former of these was first operated in 1847 and was located on the Augusta Canal, which being completed the same year and greatly enlarged in 1875, gives to that city a magnificent water-power, and affords splendid sites for factories and mills, of which the citizens of Augusta have not been slow to avail themselves. For on the banks of the canal there are now seven other factories. Yet not more than one half of the water-power of the canal has been taken up. The Eagle Mills (now known as the Eagle and Phoenix, with more than double their original capacity), built in 1851, were first operated in 1852, and have always manufactured both cotton and woolen goods. Many mills for the manufacture of both these fabrics were built at many points in the State where good water-

powers were available. The cotton and woolen mills at Roswell, on the Chattahoochee in Cobb county, were famous in the early fifties, their goods being held in high esteem and finding a ready sale in Tennessee, Alabama and Georgia. During the civil war the Roswell factory supplied good woolen cloth for suits for gentlemen and ladies.

In good locations with no available water-power, steam cotton-mills were erected, which paid good dividends to their stockholders. These facts, with the additional knowledge that factories of many kinds were in operation in Georgia, with their number and variety rapidly increasing between 1850 and 1860, show conclusively that those are greatly in error who imagine that Georgia's manufacturing enterprise is of post-bellum birth. The four years' conflict of arms between the North and South checked somewhat, though not entirely, enterprises of this kind. In the wake of Sherman's army the mills at Roswell, Madison and Eatonton were committed to the flames, as was nearly every other mill of any kind along its desolating march. And yet in 1870, or five years after the close of hostilities, Georgia had 34 cotton-mills in operation, one more than in 1860, and 85,602 spindles, or 416 more than in 1860. By 1880 the number of cotton-mills in Georgia had increased to 40, with 198,656 spindles, and by 1890 to 53, with 445,452 spindles. The capital invested in 1880 was \$6,348,657, with a product valued at \$6,481,894. In 1890 the capital had increased to \$17,664,675 and the product to \$12,635,629. In 1880 the Georgia mills consumed 71,389 bales of cotton, and in 1890, 145,869. In 1880 the average number of employees was 6,215, who received in wages \$1,135,185, while in 1890 10,530 employees received \$2,366,086. By 1896 the total amount invested in Georgia in the manufacture of cotton textiles exceeded \$25,000,000. In 1889 there were in the United States 74 machines for printing cloth, of which 44 were in Massachusetts. Only three were located in the South and they were in Georgia. In the manufacture of higher grade cotton goods, Georgia stood in the front of the States of the South, being the only one of them that furnished any bleached yarns.

Georgia and South Carolina were the only Southern States at that time bleaching cloth. The total amount bleached was in South Carolina, 2,438,468 square yards, and in Georgia 7,593,950 square yards. Another fact to be noted is that, while North Carolina had 91 mills in 1890 and Georgia 53, the value of the product of North Carolina's mills was \$9,563,443, of the Georgia mills \$12,635,629, and of the South Carolina mills \$9,800,798.

According to a report on "Cotton Movement and Fluctuations," by Latham, Alexander & Co., bankers and commission merchants of New York, in which they cover the period from 1894 to 1899, Georgia had

for the season of 1898-9 a total of 67 cotton-mills, with 696,394 spindles. These mills consumed 280,177 bales weighing 129,140,837 pounds.

The report says

"Southern cotton-mills have likewise enjoyed a more prosperous season than the previous one, especially since the first of January. They were in better condition than Northern spinners even during the last quarter of 1898. But since 1899 began, their use of the raw material has appreciably increased and the margin of profit has been wider. These changes are the natural result of the more active consumption of goods. In very many instances Southern mills have found it necessary to keep in operation night as well as day to prevent a too rapid accumulation of orders. There is as yet no sign of a check in this development. On the contrary, it is the general opinion among Southern manufacturers with whom we have been in correspondence, that the future outlook is extremely bright."

For the year from September 1, 1899, to September 1, 1900, the growth of the cotton industry in Georgia was beyond all precedent. Many new mills were put in operation and many others were in process of construction on September 1, 1900. By January 1, 1900, there were in operation in Georgia 75 mills with 913,346 spindles, and 21,903 looms. The value of these factories was \$15,614,000. By September 1, 1900, there had been completed 12 new factories and 24 others were approaching completion.

The following factories were in operation on January 1, 1900:

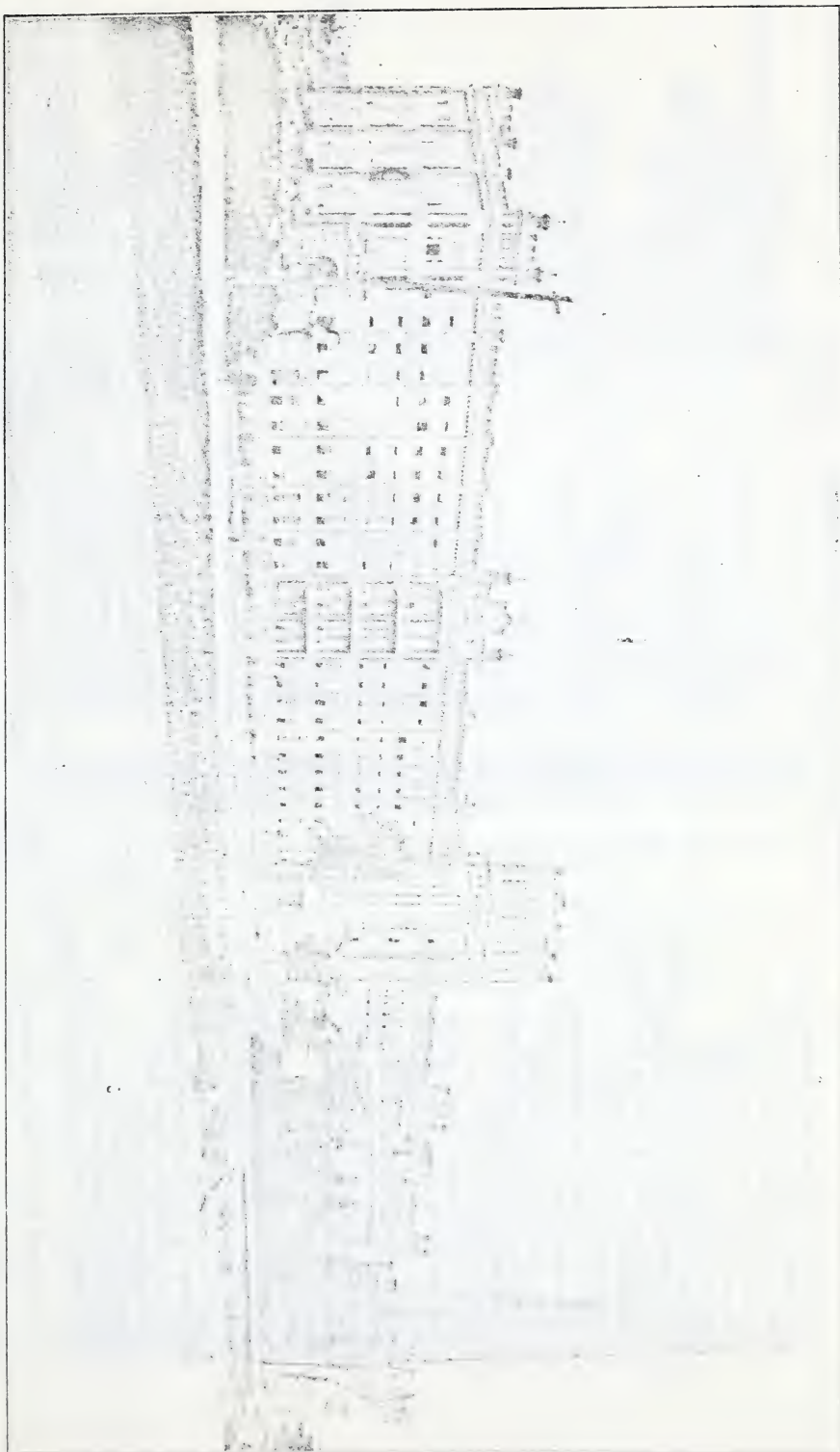
LOCATION AND NAME OF COMPANY.	Equipment Jan. 1, 1900.		Capitalization.
	Looms.	Spindles.	
Alice—Harmony Mills.....	.....	800	*\$ 25,000
Aragon—Aragon Mills.....	450	20000	200,000
Athens—Athens Manufacturing Company.....	350	10000	125,000
Athens—Georgia Manufacturing Company.....	.....	11648	* 250,000
Athens—Martinson Braided Cord Company.....	5	2000	40,000
Athens—Princeton Manufacturing Company.....	100	4000	100,000
Athens—Star Thread Company.....	.....	6000	150,000
Atlanta—Annestown Cotton Mills.....	6	2300	* 50,000
Atlanta—Atlanta Cotton Mills.....	540	18000	300,000
Atlanta—Exposition Cotton Mills.....	1433	46000	500,000
Atlanta—Fulton Bag and Cotton Mills.....	1200	45000	250,000
Atlanta—Whittier Mills (Chattahoochee).....	.....	10000	150,000
Augusta—Augusta Factory.....	1000	35000	600,000
Augusta—Enterprise Manufacturing Company.....	928	33000	750,000
Augusta—Globe Cotton Mills.....	114	1728	25,000
Augusta—Isaetta Mills.....	150	4100	25,000
Augusta—J. P. King Manufacturing Company.....	1812	60288	1,000,000
Augusta—Sibley Manufacturing Company.....	1409	43200	500,000
Augusta—Sutherland Mills.....	.....	8800	35,000
Augusta—Warwick Cotton Mills.....	224	4100	25,000
Ranning—Hutcheson Manufacturing Company.....	.....	5000	* 90,000
Barnesville—Barnesville Manufacturing Company.....	.....	12416	* 120,000
Beverly—Pearl Cotton Mills.....	.....	7500	* 40,000

LOCATION AND NAME OF COMPANY.	Equipment Jan. 1, 1900.		Capitalization.
	Looms.	Spindles.	
Cedartown—Cedartown Cotton Company .....	.....	2360 ⁰	\$ 350,000
Columbus—Clegg Manufacturing Company	116	.....	36,000
Columbus—Eagle and Phenix Mills	1754	4715 ²	750,000
Columbus—Hamburg Cotton Mills	210	600 ⁰	100,000
Columbus—Muscogee Manufacturing Company	450	1300 ⁰	157,500
Columbus—Swift Manufacturing Company	423	1300 ⁰	250,000
Cornelia—Porter Manufacturing Company	80	600 ⁰	* 125,000
Commonwealth—Christian Commonwealth	5	.....	2,500
Covington—Porterdale Mills	80	600 ⁰	* 100,000
Dalton—Crown Cotton Mills	350	1000 ⁰	* 180,000
DeBruce—Phoenix Factory .....	.....	5100	100,000
Dennard—Houston Factory	60	224 ⁰	* 60,000
Elberton—Swift's Cotton Mill	174	704 ⁰	* 100,000
Forsyth—Forsyth Manufacturing Company .....	.....	6000	* 50,000
Gainesville—Georgia Manufacturing Company .....	.....	3300	* 50,000
Griffin—Griffin Manufacturing Company	593	1500 ⁰	* 400,000
Griffin—Kincaid Mill	430	1255 ²	* 320,000
Griffin—Spalding Cotton Mills	236	8000	200,000
Griffin—Rushton Mills	150	5000	100,000
Harmony Grove—Harmony Grove Mills	156	4160	* 100,000
Hartwell—Witham Cotton Mills	102	30 0	* 40,000
High Shoals—High Shoals Manufacturing Company	150	5000	* 150,000
Jackson—Pepperton Cotton Mills	160	5400	180,000
Jewell's—Jewell Cotton Mills	121	4000	75,000
Lafayette—Union Cotton Mills	212	6750	100,000
LaGrange—Dixie Cotton Mills	354	20000	350,000
LaGrange—LaGrange Mills	75	10000	157,400
LaGrange—Park Mills	25	1000	25,000
Lindale—Massachusetts Mills in Georgia	1726	51264	1,000,000
Macon—Bibb Manufacturing Company .....	.....	25000	1,417,000
Macon—Manchester Manufacturing Company .....	.....	10000	100,000
Macon—Payne Cotton Mills .....	.....	3328	* 50,000
Macon—Willingham Cotton Mills .....	.....	7500	100,000
Monroe—Monroe Cotton Mills	534	5200	* 100,000
Newnan—Newnan Cotton Mills .....	.....	10000	* 70,000
Palmetto—Palmetto Cotton Mills	87	6000	50,000
Pottersville—Taylor Manufacturing Company .....	.....	2300	75,000
Raccoon Mills—Raccoon Manufacturing Company	104	3400	164,700
Rome—Rome Cotton Factory	106	5136	* 98,500
Roswell—Laurell Mills Manufacturing Company	67	.....	* 55,500
Roswell—Roswell Manufacturing Company	120	12600	262,000
Sargent—Wahoo Manufacturing Company .....	.....	3000	48,000
Savannah—Savannah Cotton Mills .....	.....	7736	150,000
Shoal Creek—Shoal Creek Mills .....	.....	2200	30,000
Toccoa—Toccoa Cotton Mills	160	5000	* 61,000
Trion Factory—Trion Manufacturing Company	1422	49936	* 600,000
Union Point—Union Point Manufacturing Company .....	.....	400	* 50,000
Waleska—Little River Mills .....	.....	610	* 10,000
Waymanville—Wayman Cotton Mills	76	3408	63,000
West Point—Lanett Cotton Mills	1500	50000	500,000
Whitehall—Georgia Manufacturing Company .....	.....	12000	* 120,000
Whitehall—Whitehall Yarn Mills .....	.....	2500	* 75,000
Totals (47 towns, 75 mills)	22,289	927346	\$15,914,000

* All Georgia capital.

The following new mills were completed or approaching completion on September 1, 1900:

SCENE ON THE AUGUSTA CANAL.



LOCATION AND NAME OF COMPANY.	Equipment.		Capital Stock.	GOODS TO BE MFG.	Annual Consumption Cotton.	PROGRESS OF WORK.
	Looms.	Spindles.				
Lawrenceville—Lawrenceville Cotton Mills	.....	4,000	\$60,000	Average 25 yarns....	2,500	Foundation and first floor.
Thomasston—Thomaston Cotton Mills	175	6,600	100,000	4 yd. sheeting, drills....	3,000	Completed; start October 1st.
Milton—Milton Cotton Mills	.....	5,000	80,000	Average 40 yarns....	3,100	To second story.
Tifton—Tifton Cotton Mills	.....	5,000	80,000	Average 40 yarns....	3,100	Up to first floor.
Tennille—Tennille Cotton Mills	.....	4,000	60,000	Average 40 yarns....	2,500	Halls and two floors.
Jefferson—Jefferson Cotton Mills	.....	3,000	80,000	4 yd. sheeting....	1,800	Complete; start September 1st.
Toccoa—Capps Cotton Mills	.....	5,000	50,000	Average — yarns....	30,000	Building completed.
Gainesville—Paclet Mfg. Co. of S. C.	.....	50,000	1,000,000	Standard sheetings....	30,000	First floor laid.
Greensboro—Mary-Lelia Cotton Mills	160	5,000	100,000	4 yd. plain sheetings....	3,000	Completed.
Columbus—Bibb Mfg. Co. of Macon	600	20,000	300,000	Mercerizing yarns....	12,000	Completed.
Hogansville—Hogansville Mfg. Co.	160	3,000	80,000	Heavy duck....	3,000	Running.
Juliette—Glover Mfg. Co.	.....	3,000	70,000	Coarse yarns....	1,200	Running.
Carrollton—Maudeville Cotton Mills	203	6,000	100,000	Fine yarns, sheeting....	3,500	Completed and running.
Pelham—Pelham Mfg. Co.	160	5,000	100,000	Brown sheetings....	3,000	Buildings completed, start Oct. 1st.
Valdosta—Strickland Cotton Mills	325	10,000	175,000	4 yd. sheetings....	6,200	Completed; start September 1st.
Cedartown—Standard Cotton Mills	.....	10,000	100,000	Ex. corded Hos. yns....	6,000	Completed.
Canton—Canton Cotton Mills	160	5,000	100,000	4 yd. sheetings....	3,000	Foundations laid.
Hawkinsville—Hawkinsville Cot. Mills	.....	3,000	50,000	8s to 24s yarns....	3,000	Building to first floor.
Atlanta—Elizabeth Cotton Mills	296	10,000	100,000	Hosiery yarns....	2,500	Reeking building.
Atlanta—Piedmont Mfg. Co.	.....	5,000	250,000	Sheetings....	3,000	Building completed.
Atlanta—Scottdale Mills	350	10,000	250,000	Sheetings....	6,500	Building completed.
Atlanta—Gate City Cotton Mills	160	3,500	100,000	4 yd. sheetings....	3,000	Up to first floor.
Pallas—Packing Cotton Mills	.....	4,500	75,000	Sheetings....	3,000	Building completed.
Quitman—Atlantic and Gulf Mills	70	3,500	75,000	Yarns....	2,500	Running day and night.
Monkrie—Monkrie Cotton Mills	160	5,000	100,000	4 yd. sheetings....	3,200	Building to second story.
Dublin—Dublin Cotton Mills	160	5,000	100,000	Sheetings....	3,000	Foundations going up.
Columbus—Columbus Mfg. Co.	640	25,000	350,000	Sheetings....	15,000	Building completed.
Thomson—John E. Smith Cot. Mfg. Co.	.....	2,500	60,000	Hos to 32s hosiery yns....	1,300	Running.
Easton—Easton Electric Co	100	2,000	60,000	4 yd. sheeting....	1,000	Running.
Easton—Middle Georgia Cotton Mills	.....	5,000	100,000	Yarns....	6,500	Foundations laid.
Covington—Covington Mills	320	5,000	100,000	Sheetings....	6,000	First floor timbers laid.
Monroe—Walton Cotton Mills	160	5,000	100,000	Sheetings....	3,000	First floor timbers laid.
Winder—Winder Cotton Mills	.....	5,000	100,000	Yarns....	3,000	Laying foundations.
Newnan—Newnan Cotton Mills No. 2	.....	8,000	150,000	26s to 40s for mer....	4,000	Laying foundations.
Cochara—Cochara Cotton Mills	.....	3,500	60,000	Yarns....	2,700	Building and operatives cottages.
Hampton—Hampton Cotton Mills	.....	2,500	50,000	Hosiery yarns....	2,000	Up to the roof.
Totals (Towns, 32; Mills, 36)	4,356	165,110	\$4,775,000	Average coarse....	191,600	

* All Georgia capital. ** Drawn to double capacity.

SUMMARY.

Mills in operation January 1, 1900.....	75
Mills built 1899-1900.....	36
Total mills	111
Value of factories in operation	\$15,914,000
Value of factories building	4,775,000
Total value of factories.....	\$20,689,000
Spindles in operation January 1, 1900	927,346
Spindles installed in new mills.....	265,140
Total number of spindles	1,192,486
Looms in operation January 1, 1900	22,289
Looms installed in new mills	4,356
Total number of looms	26,645
Cities and towns with mills January 1, 1900.....	47
Cities and towns with new mills	36
Total of cities and towns with mills.....	83
Capital of organized and proposed mills.....	\$ 1,757,000

The Division of Statistics of the United States Department of Agriculture, after a more thorough and searching investigation than ever before in regard to the growth of cotton spinning in the South, published in 1901 the following table prepared by Mr. John Hyde:

PROGRESS OF COTTON SPINNING IN THE COTTON STATES.

States.	Number of Spindles.		No. of Mills in Operation.				New Mills, 1900.		
	1890	1900	1890	1897-1898	1898-1899	1899-1900	Completed, etc.	Projected.	Total
Alabama	79,234	437,200	13	37	38	44	5	5	10
Arkansas	} a 66,980	{		1	2	3	4	1	1
Louisiana				2	3	3	5	3	3
Missouri				1	3	3	4		
Texas				1	4	5	6	3	3
Georgia	445,452	969,364	53	77	79	86	28	13	41
Kansas		2,000				1			
Kentucky	42,942	68,730	5	11	11	10			
Mississippi	57,001	88,584	9	7	7	10	7	2	9
North Carolina	337,786	1,264,509	91	161	169	190	28	6	34
South Carolina	332,784	1,693,849	34	76	80	93	25	2	27
Tennessee	97,524	155,997	20	29	29	32	5	3	8
Virginia	94,294	165,452	9	15	17	15			
Total	1,554,000	5,001,487	239	425	444	500	105	34	139

a Total for Arkansas, Louisiana, Missouri and Texas; details for each State not given in census report of 1890.

The increase in the number of mills in each State from 1899 to 1900 is: Alabama 6, Arkansas 1, Georgia 7, Kansas 1, Louisiana 2, Mississippi 3, Missouri 1, North Carolina 21, South Carolina 13, Tennessee 3, and Texas 1; total, 59. The records of the Department show, as is seen by the above table, 105 new mills completed in 1900, of which number Georgia is credited with 28. The report of the Division of Statistics says moreover: "Thirty-four additional mills are projected, that is, companies have actually been organized and are making preparations to build." Of these 34 Georgia is credited with 13, or more than double the number in any other State.

Of the next table taken from this same report the following statement is made: "All the figures are based upon actual statements made by the officials of the mills in operation, which include woolen as well as cotton-mills, showing their monthly purchases during the season, their statements having been revived at the close of the year. Of the 501 mills not a single one failed to report, either to the Department directly or to the Department's special agent detailed for this work."

COMPARATIVE MILL STATISTICS FOR 1898-99 AND 1899-1900.

[In commercial bales.]

STATES	Number of Mills		Bales Purchased		Per Cent. of Increase or Decrease of Bales Purchased	
	1898-99	1899-1900	1898-99	1899-1900	Increase	Decrease
Alabama.....	38	44	121,128	154,841	27.8	.....
Arkansas.....	3	4	3,288	2,394	.....	27.2
Georgia.....	79	86	281,527	318,302	13.1	.....
Kentucky.....	11	10	25,447	26,008	2.2	.....
Louisiana.....	3	5	18,749	15,695	.....	16.3
Mississippi.....	7	10	21,650	21,440	.....	1.0
Missouri.....	3	4	3,017	3,720	23.3	.....
North Carolina.....	169	190	374,891	442,508	18.0	.....
South Carolina.....	80	93	466,181	489,559	5.0	.....
Tennessee.....	29	32	36,358	34,882	.....	4.1
Texas.....	5	6	17,156	16,868	.....	1.7
Virginia.....	17	15	44,502	44,595	0.2	.....
Utah and Kansas.....	1	2	34	186	447.0	.....
Total.....	445	501	1,413,928	1,570,998	11.1	.....

The following table shows the cotton crop of each State for the season of 1899-1900, the amount of cotton purchased by the mills of each State, the amount taken by the mills of one State from the crop of another, etc.:

CROPS AND MILL CONSUMPTION, 1899-1900.

[Commercial bales.]

STATES	Crops	Total mill con- sumption	Taken by mills from other States	Per cent. of State's production taken by mills with- in the State	Per cent. of mill con- sumption taken from other States
Alabama	1,005,313	154,841	13,929	14.0	9.0
Arkansas	669,385	2,394	61	0.3	2.7
Georgia	1,345,699	318,392	16,269	22.4	5.1
Kentucky	24	26,008	26,008	.....	100.0
Louisiana	699,476	15,695	.....	2.2	.....
Mississippi	1,203,759	21,440	262	1.8	1.2
Missouri	17,275	3,720	3,720	.....	100.0
North Carolina	503,825	442,508	148,487	58.4	33.6
South Carolina	830,714	489,559	119,100	44.6	24.3
Tennessee	192,263	34,882	13,187	11.3	37.8
Texas	2,438,555	16,868	.....	0.7	.....
Utah and Kansas	214	186	60	.....	.....
Virginia	8,607	44,595	43,570	12.8	97.7

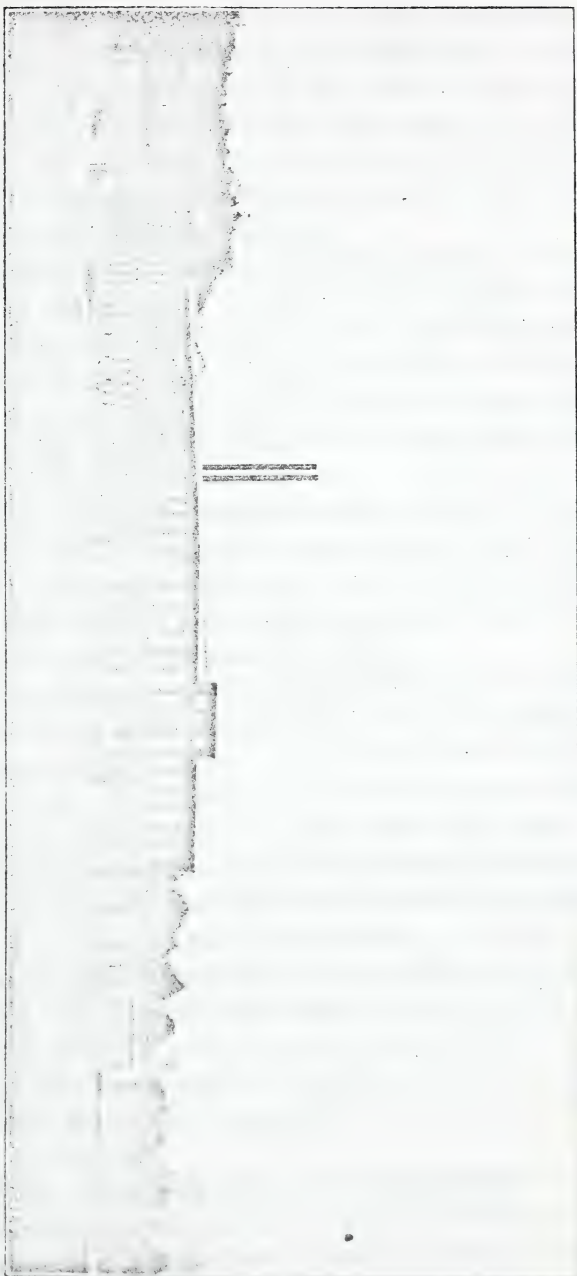
Woolen-Mills.—The woolen industry of Georgia has been subject to considerable fluctuation. The first woolen factory in the State was reported in 1840. The number increased to three in 1850, eleven in 1860, and 46 in 1870. The capital invested also showed a steady increase during the same period, reaching the maximum of \$936,585 in 1870.

With the decline of sheep-raising and wool-producing in Georgia, came a falling off in the number of mills and the capital invested in them, and in 1880 there were 32 mills with a capital of \$180,733, and products valued at \$239,390. In 1890 the number of establishments engaged in the manufacture of woolen goods in Georgia was 18, of which 4 were equipped with machines for making hosiery and other knit goods, and the rest with spindles and looms for the production of woolen cloth, such as jeans, doeskins, kerseys, satinets, cassimeres, and chevviots. Though the number of mills was less than in any other decade since 1860, the capital invested, \$420,033, was larger than that reported at any census except that of 1879, and the value of the product, \$340,095, is clear beyond that of 1880.

Labor.—By reason of her climate the cost of living in the South is much less than at the North. In Georgia the laborer can live in comfort for less money. Hence he can, without injustice to himself and family, work for smaller wages.

According to the report of the United States Commissioner of Labor in 1891, the average expenditures of each individual amounted in Geor-

ALACON COTTON MILLS, ALACON, GA.



gia, to \$94.26, and in Massachusetts to \$177.93. The detailed statement of the Commissioner as to the condition of families and their indulgences in the comforts of life proves that the difference in the cost of living was not due to the failure of the Georgia operative to provide healthful food and the comforts of home. Neither does Georgia labor under any disadvantage from lack of ability on the part of the native Southern mill operative. The factory hands employed in the cotton and woolen-mills of Georgia are nearly all American, mostly natives of the Southern States. They have up to this time shown great aptitude for their work, and soon become skilled and proficient laborers.

Although of late years there has been a wonderful growth in Georgia in the manufacture of higher grade fabrics, the improvement of the native workman has kept pace with this growth. The marvelous increase of the number of mills and spindles in Georgia during the last two years gives assurance that this State with unsurpassed advantages and inducements will continue either to lead or to stand in the front rank of this great and wonderful advancement.

With the splendid advantages for sheep-husbandry offered by Georgia there is no reason why there should not be raised in this State millions of these wealth-producing animals, whose wool would build up a milling industry rivaling in extent that of cotton, and increasing immensely the prosperity of the people and the revenues of the State.

Silk Factories.—An industry which in the last few years has grown rapidly in the United States is the manufacture of silk. In 1890 there were 718,360 spindles and 20,822 looms. In 1900 there were 1,426,245 spindles and 48,246 looms. It is mostly confined to the northern States; but Virginia and North Carolina have entered this field, each with 30,000 spindles. North Carolina has also 1,455 looms, and Virginia 350. Although Georgia was originally intended to be a silk-producing country, at this time the State is taking no part in this business. Yet the founders of the colony of Georgia thought that its chief industry would be the production of raw silk. General Oglethorpe in speaking of the possibilities of the colony said: "It must be a weak hand indeed, that cannot earn bread where silkworms and white mulberry-trees are so plentiful." Perhaps at some future day Georgia will realize in this industry the expectations of its founders.

Cotton seed Oil Mills.—The value of the cotton seed, as food for stock, for oil and for fertilizing purposes, was long unknown. When the farmer had gathered his cotton and ginned out the seed, he baled the lint and sold it for the best price that it would bring, and thought that he had received all the possible profit of his crop. No longer is this the case.

Among the farmer's profits now must be counted those derived from the sale of his cotton seed, for which the rapidly increasing cotton seed-oil mills have created a great demand. This by-product of the cotton is worth to the farmers of Georgia millions of dollars annually. Not even the cotton factory, whose coming to the fields, is hailed as a harbinger of good to the planter, is more closely allied to the agricultural interests of Georgia than the mills that utilize the seed, once held in such poor esteem. They furnish to the farmer the meal, the cakes and hulls, a cheap and wholesome food for all farm animals, supply him with an excellent fertilizer, and give him in the cotton seed-meal a material largely used by the manufacturer of fertilizers to supply nitrogen in his chemical fertilizer. This meal the farmer can use upon his fields either alone or in the compost heap, thus giving to them that most costly of all plant foods, nitrogen.

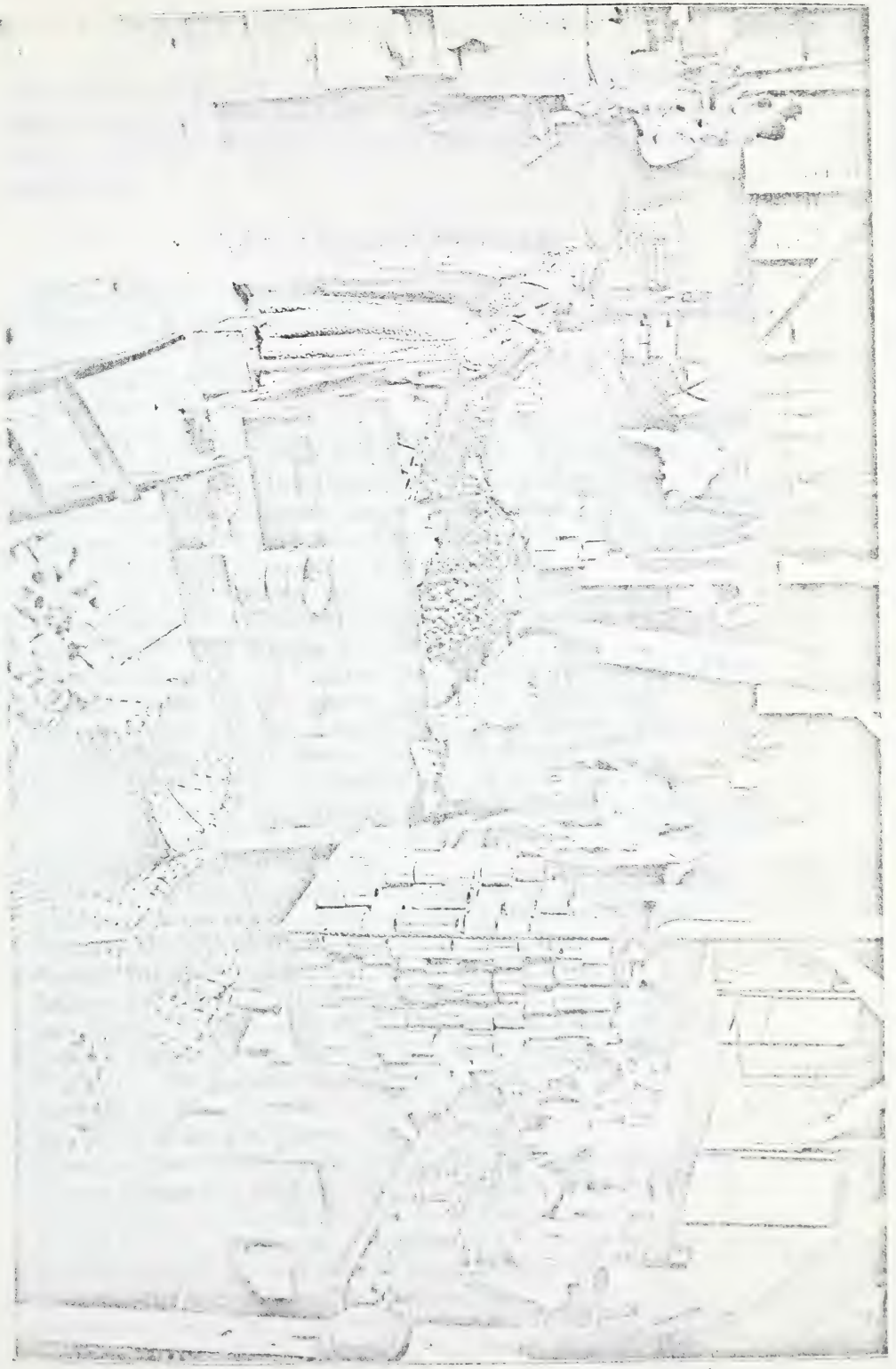
The oil extracted at these mills has many uses. The crude oil, often refined, is known as summer oil. A prime, summer, yellow oil, also called butter oil, is used in making oleomargarine, butterine, cottolene, etc. A selected yellow oil, subjected to cold pressure, becomes a salad oil, and is used in cooking. Bleached summer oil, also known as summer white oil, is used for making compound lard and similar articles. When this same oil has been cold pressed, it is called winter white oil, and is used in miners' lamps and for making various medicinal compounds. The ordinary summer yellow oil is used for tempering steel and other manufacturing purposes.

Cotton seed oil ranks next to sperm for purposes of illumination. It is however, in greatest demand as a food oil, and has to a considerable extent taken the place of olive oil. The stearine which is left on the cloths in the filter press, when the oil is refined, is used in making butter, lard and candles.

We can easily see that the cotton seed-oil mill is a very important industry in Georgia. The farmer has a sure market for all his seed not needed in planting. As we have said in a previous chapter, for every pound of lint cotton there are two pounds of cotton seed, which is sold at \$6, \$11, and even \$24 a ton.

In 1880 there were no cotton seed oil-mills in Georgia. By 1890 there were 17, with a capital of \$992,131, paying for material \$1,298,421 and giving a product valued at \$1,670,196. By 1896 there were 20 of these mills paying for seed \$1,400,000 annually, and giving a product valued at \$1,800,000. In the year 1900, there were 52 active oil mills with an approximate capital of \$2,500,000, not counting money borrowed on mortgages. These mills paid last year \$5,000,000 for cotton seed

THE CHURCH OF ST. MARY, AND ITS VICARAGE



alone, not counting other material necessary for manufacturing the raw material into commercial products. The value of these products was for last year \$14,000,000 approximately. Six new mills are in process of construction.

LIST OF GEORGIA OIL MILLS.

- Americus Oil Co., Americus, Ga., M. S. Harper, Mgr.
Athens Oil & Fert. Co., Athens, Ga., J. A. Smith, Pres., Abbeville,
S. C.
Arlington Oil & Fert. Co., Arlington, Ga.
Blackshear Mfg. Co., Blackshear, Ga.
Co-operative Mfg. Co., Forsyth, Ga., P. B. Maynard & Co., Mgrs.
Carrollton Oil Mills, Carrollton, Ga., J. A. Aycock, Mgr.
Excelsior Mfg. Co., Washington, Ga., J. A. Benson, Pres.
Elberton Oil Mills, Elberton, Ga., A. E. Thornton, Pres., Atlanta, Ga.
Farmers Cotton Oil Mfg. Co., Locust Grove, Ga., A. G. Combs.
Fort Gaines Oil & Guano Co., Fort Gaines, Ga.
Griffin Oil & Fert. Co., Griffin, Ga., Walker Bros.
Gainesville Oil Co., Gainesville, Ga., J. D. Woodside, Pres.
Gate City Oil Co., Atlanta, Ga., John Oliver, Pres.
Georgia Cotton Oil Co., Atlanta, Ga., W. J. Montgomery, V-Pres.
Georgia Cotton Oil Co., Macon, Ga., R. S. Patillo, Mgr.
Georgia Cotton Oil Co., Augusta, Ga., J. H. Taylor, Mgr.
Georgia Cotton Oil Co., Rome, Ga., W. M. Towers, Mgr.
Georgia Cotton Oil Co., Columbus, Ga., J. A. Walker, Mgr.
Georgia Cotton Oil Co., Albany, Ga., J. R. Forrester, Mgr.
Georgia Farmers Oil & Fert. Co., Madison, Ga., B. A. Warlick, Mgr.
Grovania Oil Co., Grovania, Ga.
Hardman Oil Co., Harmony Grove, Ga., L. G. Hardman, Pres.
Interstate Cotton Oil Co., Augusta, Ga., J. D. Dawson, Mgr.
Jefferson Oil Mill, Jefferson, Ga., H. W. Bell, Pres.
Jackson Oil Mill, Jackson, Ga., H. M. Mallet, Pres.
Lathrop Oil Mills Co., Hawkinsville, Ga.
LaGrange Mills, LaGrange, Ga., J. M. Barnard, Pres.
Lavonia Cotton Oil Co., Lavonia, Ga., L. H. Meekin, Mgr.
Middle Ga. Oil & Fert. Co., Hogansville, Ga.
McBride Oil Co., Newman, Ga., R. McBride & Co.
Macon Oil & Ice Co., Macon, Ga.
Milledgeville Oil Mills, Milledgeville, Ga., A. E. Thornton, Pres.
Monroe Guano Co., Monroe, Ga., T. C. Mobley, Secy.
McCaw Mfg. Co., Macon, Ga., W. E. McCaw, Pres.
Mutual Oil Co., Macon, Ga., Mr. Gray.
Pelham Oil Mill, Pelham, Ga., or Hand Trading Co.
Rockdale Oil & Fertilizer Co., Conyers, Ga.
Smithonia Cotton Oil Mills, Smithonia, Ga., J. M. Smith, Prop.
Southern Cotton Oil Co., Savannah, Ga., L. W. Haskell, Mgr.

Southern Cotton Oil Co., Atlanta, Ga., L. A. Ransom, Asst. Mgr.
 Talbot Co. Oil Mills, Talbotton, Ga.
 Valdosta Guano Co., Valdosta, Ga.
 West Point Oil Mills, West Point, Ga., D. H. Hickey, Mgr.
 Wilkins & Jones, Waynesboro, Ga.
 Waynesboro Oil Mill & Fert. Co., Waynesboro, Ga.
 Cedartown Cotton Oil Co., Cedartown, Ga.
 Conyers Oil Co., Conyers, Ga.
 Dublin Oil Mills, Dublin, Ga.
 Dawson Oil Mills, Dawson, Ga.
 McBurney Oil & Fert. Co., Warrenton, Ga.
 Walton Oil Co., Social Circle, Ga.
 Washington Co. Oil Co., Tennille, Ga.

Cotton Ginning.—Of course every farmer must have recourse to a cotton-gin in order to separate the lint from the seed. Cotton ginneries are divided in the census reports into three general classes, viz.: those conducted exclusively for the public; those conducted exclusively for the plantation; those conducted for both the public and the plantation.

The following table gives the number and charecter of ginneries and number of months operated for crop of 1899 by States and Territories: number of months operated for crop of 1899-1900 by States and Territories:

States and Territories.	NUMBER OF GINNERIES.				Average number of months in operation for crop of 1899.
	Total.	Operated for—			
		The public only.	The plantation only.	Both.	
Total	29,620	6,468	2,863	20,289	3
Alabama	4,034	792	391	2,851	3
Arkansas	2,630	668	133	1,829	3
Florida	236	78	10	153	3
Georgia	4,729	696	572	3,461	4
Indian Territory	297	215	6	76	4
Kansas	2	1		1	2
Kentucky	2	1		1	1
Louisiana	2,148	190	361	1,597	3
Mississippi	3,976	519	580	2,877	4
Missouri	56	40		16	3
North Carolina	2,573	431	278	1,864	3
Oklahoma	133	109		24	3
South Carolina	3,308	298	381	2,689	3
Tennessee	834	255	45	534	3
Texas	4,514	2,165	100	2,249	4
Virginia	88	15	6	67	3

It will be seen that Georgia came first in 1899, in the total number of ginneries, Texas second and Alabama third.

In 1879 a large percentage of the cotton crop of the United States was handled by private ginneries, and their motive power consisted for the most part of horses or mules, and their daily capacity was from three to five bales.

The introduction of steam power has crowded out the primitive horse ginneries to such an extent that they are now almost a thing of the past.

Of the 29,620 cotton ginneries in the United States in 1899, only 2,863, or less than 10 per cent., are reported as ginning exclusively for the plantation, and a very small percentage of these are of the old-fashioned horse-power variety.

Fertilizer Manufactories.—Georgia consumes more chemical fertilizers than any other State in the Union. With all her advantages for diversity of manufactures she ought to be the largest producer. She does outrank all the Southern States in this industry, and always produces enough to supply the needs of our own people if the entire products were consumed in the State. But some of the Georgia farmers purchase fertilizer goods manufactured in other States, while a large part of the Georgia product is shipped abroad and sold outside our borders. This business is closely allied to that of the cotton seed-oil mill; for the cotton seed-meal produced by the latter is extensively used for the purpose of supplying nitrogen in the goods prepared by the fertilizer manufacturer.

In 1880 there were in Georgia only three fertilizer factories giving employment to 67 men who received \$22,872 in wages, and produced goods valued at \$256,500. In 1890 there were 44 establishments with a total capital of \$5,501,881, in which 1,328 laborers were employed, whose wages amounted to \$184,889, and whose product amounted in value to \$5,026,034.

In October, 1899, there were 110 fertilizer establishments of which 32 were also enlarged in the manufacture of cotton seed-oil. Besides those were 30 establishments from other States, North and South, selling fertilizers in Georgia. A special act of the legislature passed and approved October 9, 1891, places all this business under the control of the commissioner of agriculture and protects the farmer from fraudulent fertilizers.

A special bill, approved July 22, 1896, also forbids the sale of any cotton seed-meal that is shown by the official analysis to contain less than $7\frac{1}{2}$ per cent. of ammonia, provided this shall not apply to long-staple cotton, the analysis of which must show not less than $5\frac{1}{2}$ per cent. of ammonia.

A third bill approved December 21, 1897, prescribes the manner of branding and grading commercial fertilizers.

In 1900 Georgia consumed 412,755 tons of fertilizers. The consumption for 1901 amounted to about 478,000 tons, showing a considerable increase.

Other Chemicals.—For the manufacture of other chemicals in Georgia there were five other establishments in 1890 with a total product valued at \$680,497. Among the items enumerated were paints, varnishes, japsans and pharmaceutical preparations. This business has greatly increased in every way within the last decade.

Lumber Manufacture.—This is one of the most extensive industries in the State, and together with the tar and turpentine business has brought into the cities of Savannah and Brunswick a vast quantity of material for exportation, making the former of those cities the greatest lumber and naval stores market in the world. The trade arising from these industries adds much also to the prosperity of the smaller Georgia ports of Darien and St. Marys. There were reported for the census of 1890 lumber mills of all kinds in Georgia to the number of 516, whose total product was placed at \$9,855,067. Of these mills 434 were engaged in producing lumber and other mill products from logs or bolts, while 82 were planing-mills, manufacturing sashes, doors, blinds, boxes, and other planing-mill products, such as wood turned and carved and all kinds of carpentry material. The basis of this immense business is the far-famed long-leaf pine of Southern Georgia, for which millions of feet of lumber are annually marketed. Its durability and adaptability for every class of building, interior decoration and many kinds of ornamental work, have gained for it high esteem. In the Appalachian range through North Georgia there are also extensive forests of hardwood trees, which are comparatively undeveloped. In many of the counties there are bodies of these trees from which the planing-mills gather material for the manufacture of furniture of all sorts. Between 1880 and 1890 there was a very great increase in the planing-mill product. This increase was from \$737,200 to \$3,548,972 within the decade. It has been estimated that the valuation put upon the total lumber output of Georgia by the United States census of 1890 was at least 50 per cent. short of the actual value. Great difficulty attends the securing of exact reports.

Rosin and Turpentine.—This business depends on the long-leaf pine of Southern Georgia, and is known as navel stores. The rosin is drawn from the standing tree which, after the exhaustion of its sap, is cut down, transported to the mill, and sawed into lumber. The increase in the output of this business has kept pace with that of other industries of Geor-

gia. The value of the entire product in 1880 was \$1,455,739. By 1890 it had more than doubled and amounted to \$4,242,255.

When the trees have been removed there remains a cleared field well suited to agricultural purposes, in some instances adapted to the raising of the highest priced cotton, the long-staple or sea-island variety, or other staple crops. Especially are these fields fitted to the planting of market gardens for raising fruits and vegetables, a business for which there is an ever-increasing demand in the growing cities of our own State, or those of the whole Atlantic coast from Brunswick, Georgia, to Boston, in Massachusetts.

Considering the whole product of the pine forests together, there is probably as much capital invested in it as in any other one interest, perhaps more. An Atlanta capitalist purchased a tract of timber land in South Georgia for which he paid \$75,000. After having sold from it enough lumber to pay for the property, he estimates that there remains on it enough timber to bring him, when cut, \$150,000. When the land has been cleared at a big profit to himself he expects to use the tract for fruit-growing or for general farming purposes. This is only one example among many of the great possibilities of Southern Georgia.

Furniture Factories.—This is a large and profitable business in Georgia. According to the census of 1890 the capital invested in all lines of this business amounted to \$1,036,825, and the value of the products for that year was \$1,633,813. This industry has been greatly enlarged during the last decade. The 13 establishments of the city of Atlanta alone reported in 1897 an annual product worth \$1,164,000. Much of the furniture manufactured is of a high grade, and is largely sold in the Eastern markets. This is especially true of Atlanta, whose furniture factories are always represented at the annual exhibit at Grand Rapids, Michigan. The growth in this business in the last three years has been very great.

Foundries.—Georgia has no great iron plants like those of Alabama and Tennessee; and yet there is in the State a well developed iron industry, in which a large capital is invested and from which large profits are derived. The many foundries manufacture machinery, agricultural implements, boilers, cotton-gins and castings. The census of 1890 showed that there were in Georgia 52 iron foundries with a capital of \$2,107,969 and an annual output valued at \$2,272,653.

The cotton-gins and presses manufactured in Georgia are unrivaled. Often the factories, working night and day, can hardly supply the demand from every section of the South.

Ornamental Iron Works.—The business of making architectural and

ornamental work from iron is of considerable importance and is on the increase in Georgia. By the census of 1890 there were in the State three factories for turning out this kind of work. The capital invested in them was \$67,242 and their product was worth \$110,075.

Iron and Steel.—One of the most notable features of the growth of the iron and steel industry of the United States is the activity displayed in the Southern States in the erection of iron-making plants. Steel-making, though not wholly neglected, has not formed a prominent feature of this metallurgical development. Under the head of "iron and steel industry," the census of 1890 reported for Georgia five establishments which had at that time a capital of \$908,243 and a product valued at \$471,357.

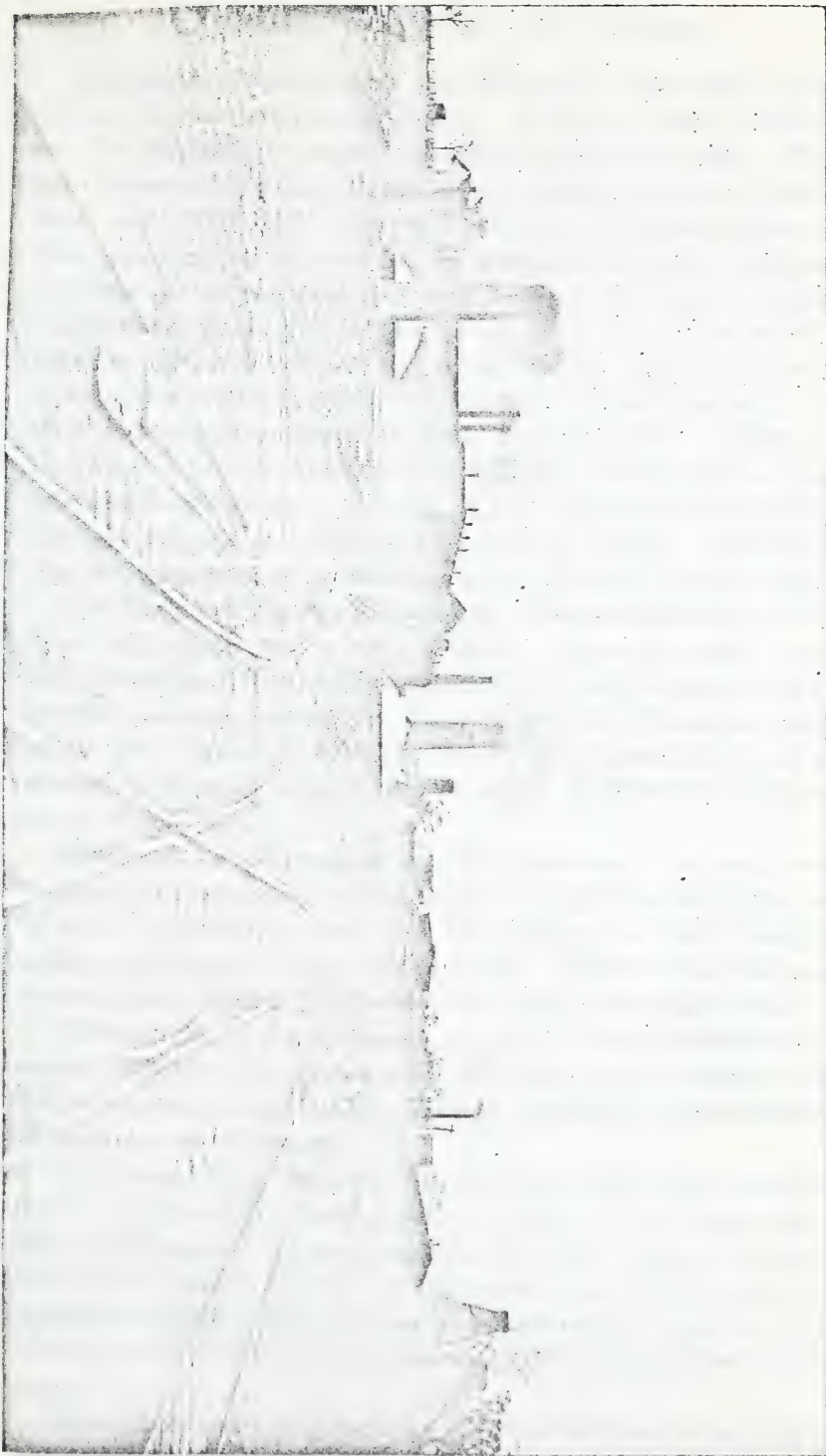
Blast Furnaces.—In speaking of the pig-iron industry of the Southern States the United States census report of 1890 said: "This section has long been noted for the excellent character of the charcoal pig-iron produced within its borders; but prior to 1880 attention was not especially directed to its extensive and easily worked deposits of iron ore, nor to the advantages which the close proximity of coking coal and limestone to these deposits afforded for the production of coke pig-iron at low cost. During 1880 the Southern States produced 9.27 per cent. of the aggregate pig-iron yield of the United States, but in 1890 the furnaces in this section contributed 18.52 per cent. of the total output, the increase in tonnage over 1880 being 423.52 per cent." According to the census of 1890 there were in the State of Georgia four blast furnaces with a capital of \$748,845, and an output valued at \$339,422. "The pig-iron industry of Georgia," says the census report, "remained practically stationary during the decade from 1880 to 1890." The greater part of the iron ore mined in Georgia is shipped beyond the State.

Carriage and Wagon Factories.—Under this heading are included custom work and repairing. There were in 1890 as many as 129 of these factories in Georgia, some of them doing the best grade of work. The buggies manufactured at Barnesville enjoy a fine reputation.

The capital employed by these establishments in 1890 was \$849,441 and their output was valued at \$1,221,119. The number of establishments, their capital and product have steadily increased in the last decade.

In addition to these factories were several where carriage materials were made.

The Blacksmithing and Wheelwrighting Establishments, which ten years ago numbered 331, with an aggregate capital of \$245,721, turned out annually work worth \$265,315.



STEVENS POTTERY WORKS, BALDWIN COUNTY.

Car Shops.—Most of these are operated by the railway companies, and are for construction and repairs. At some of them excellent box-cars for freight and handsome passenger coaches are made. The number reported in 1890 was eleven, with a capital of \$450,512, and doing work worth \$842,610. The rapid increase of business on the railroad lines, and the constant need for new cars and for repairs to old ones, insure constant employment for many hands in this kind of work.

Flour and Grist Mills.—The falling off in the cultivation of wheat between 1880 and 1890 led to a corresponding decrease in the number of mills, the capital invested, and the value of their products. During that decade the numbers of mills decreased from 1,139 to 719, their capital from \$3,576,301 to \$2,347,835, and their output showed a corresponding decrease. A revival of wheat growing has commenced in Georgia, and with it a revival of the milling industry. Many old mills that had shut down have started up again, and new ones have been built.

The Bread and Bakery products are always in demand, whether the flour used be imported or made at home. Hence the rapid increase in the population of Georgia between 1880 and 1890 caused almost a triple increase in these products for the same periods. Twenty-six establishments with a capital of \$118,450 and a product worth \$464,162 had increased to 76 establishments with a capital of \$394,356, and products worth \$1,241,349.

Brick and Tile Manufactories.—The presence of so much excellent material for the manufacture of brick in Georgia has led to the erection of many establishments devoted to this industry, in which Georgia takes high rank among the States of the South. The brick and tile manufactories showed between 1880 and 1890 a very gratifying increase.

Although the 76 establishments of 1880 had been reduced to 61, the capital of \$212,660 had increased to \$950,263, and the product of \$409,025 had grown to \$1,201,542. With the growth of cities and towns this business is sure to increase.

Clay and Pottery Products.—In addition to brick and tiles there are other products of clay, such as pottery, drain and sewer pipes, etc. For the manufacture of the various articles from clay (exclusive of brick and tiles), there were in Georgia in 1890 seventeen establishments with an aggregate capital of \$229,269 and an annual output valued at \$211,250. There has been during the last decade a gratifying increase in this business.

Ocher Mills and Paint Industry.—Ocher, the basis of paint, is one of the mineral products of Georgia. The mining and shipment of yellow ocher has become a considerable business in Bartow county. There are

at Cartersville four mills for the handling of this material. The shipment of ocher from this county for the year ending August 1, 1900, amounted to 4,500 tons, which, at the average price of \$12.29 a ton, amounted to \$55,305. Superior natural advantages for the grinding and mixing of ready mixed paints are enjoyed by the manufacturers of these articles in Atlanta where the market for them is always good.

Ice Plants.—The factories for the manufacture of artificial ice, which in 1890 numbered 16 with an aggregate capital of \$187,534, have greatly increased their capital and business and have with their much cheaper products, run out of the markets of Georgia the imported natural ice which in former years was sold at such high figures that comparatively few people could indulge in what was then an expensive luxury.

Electric Light Plants.—Although electric lighting had been introduced into our large cities previous to 1890, no report of these plants appeared in the eleventh census. There are now 50 of them in Georgia brilliantly illuminating all our large cities and many of the smaller ones, including towns of less than 3,000 inhabitants.

Electric Motors.—The electric plants furnish the motor-power for propelling cars on the streets of cities, and in several instances giving to the large cities such frequent and rapid connection with neighboring towns and all the intervening country as to make of them practically one community. All the large cities of Georgia and some of the smaller ones have excellent systems of electric railroads.

Gas for Illuminating and Heating.—Before the days of electric lights and motors, gas was the great illuminating power, and was long the best dispenser of light in darkness for cities and towns. Although surpassed in brilliancy by electricity, its days of usefulness are not yet ended even in buildings where electric lights are used. Its utility as a supplier of heat for household purposes is appreciated wherever the gas-stove is used for warming offices, or for avoiding in summer the excessive heat of wood or coal by means of the neat and convenient gas-stove. The million and a half dollars invested for gas illuminating and heating in Georgia cities and towns in 1890, still finds reason for the increase of its capital, and abundant demand for the bestowal of its benefits upon the people.

Printing and Publishing.—Nor is Georgia a laggard in printing and publishing, especially of newspapers and periodicals. Her many hundred establishment, with capital and product running up into the millions, show the high position which she holds in this respect. Some of her leading newspapers rank among the first in America and are found on sale in the chief cities of the Union.

Marble and Stone Work.—Georgia marble and stones for building and

for monuments, enjoy an enviable reputation throughout the whole Union. In 1890 under the heading given to this paragraph the United States census gave the total value of products as \$375,520. According to Dr. Day, of the United States Geological Survey, the value of the marble production for 1899 was \$742,554, and of granite \$411,344. This shows a wonderful and gratifying increase.

Ship-Building.—Georgia was also represented by this industry in the census report of 1890, according to which four establishments with a capital of \$156,100 turned out work valued at \$126,300 for the year in which the report was made.

Paving and Paving Materials.—In the manufacture of paving materials and in paving the \$67,000 invested in 1890 showed a product valued at \$513,648, showing a splendid profit on the investment. This business has also enjoyed a wonderful increase in the last decade.

Roofing, Etc.—Roofing and roofing materials with a capital of \$40,000 showed also a product of \$180,960, while tin smithing, coppersmithing and sheet iron working for an investment of \$282,770 reported a product worth \$528,814.

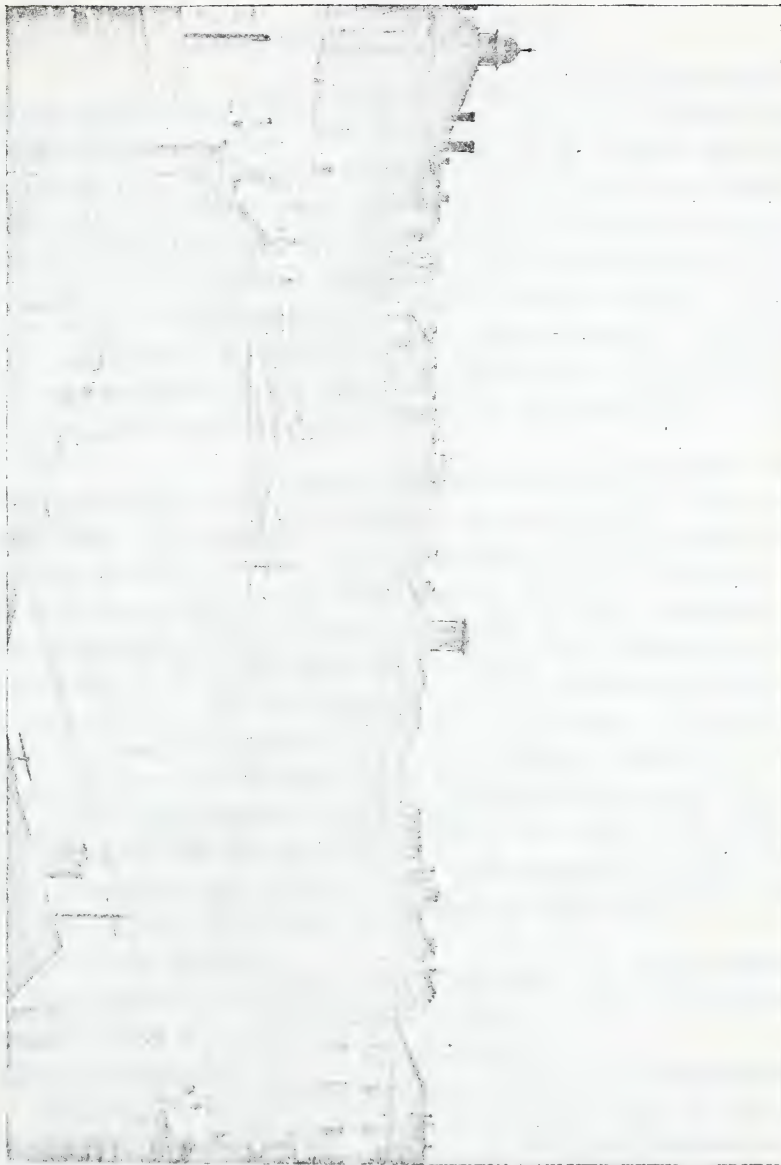
Carpenter Work.—This is always in demand in town and country, and the business is bound to increase with population and wealth. The value of work runs up into the millions.

Other Industries.—Other industries that make a good showing in census reports are factories for boots and shoes, brooms and brushes, clothing, coffins, burial cases and undertakers' goods, dentists' materials, drugs, perfumes and cosmetics, confectionery, cooperage, dyeing and cleaning, hand stamps, leather, tanned and curried, lime and cement, liquors, distilled and malt, lock and gunsmithing, looking-glass and picture frames, masonry, brick and stone, mattresses and spring beds, musical instruments, millinery, painting and paper hanging, paper and paper bags, plastering and stucco work, photography, plumbing and gas fitting, saddlery and harness, shirt manufacturers, the manufacture of chewing and smoking tobacco and snuff, manufacture of trunks and valises, umbrellas and canes, vinegar and cider, watch, clock and jewelry repairing and wooden ware. All these manufactures of Georgia here bunched together, but stated separately in the census report on manufactures, represent a combined capital and a value of products covering several million dollars. Then the census enumerates a long string of small industries, some of which are baskets and willow ware, lithographing and engraving, stereotyping, electrotyping, wire work, rope, cable, etc. To name them all would require much space. They represent altogether a capital of nearly \$2,000,000 and a product of more than \$3,000,000.

Canning Factories.—The canning and preserving of fruit made but a small show in the census of 1890. But at the present time this has become a great industry in the fruit sections of Georgia. The four canning establishments of 1890 have increased to 10.

Creameries.—This is an industry which does not appear at all in the census of 1890. But the growth of dairy farms in Georgia has created new wants, and creameries are the result. There are now three of these establishments, which purchase the products of the dairy farms and manufacture butter and cheese.

The growth of the manufacturing interests of Georgia has been very rapid within the last twenty years. Many old establishments have been greatly enlarged, many new enterprises giving employment to thousands of laborers have been established, and manufactures of all kinds have increased to such a point, that scarcely any industry lacks representation.



CAMPUS, UNIVERSITY OF GEORGIA.

CHAPTER XIII.

EDUCATION IN GEORGIA.

In the earliest days of the colony of Georgia provision was made for the education of the people. For this purpose the rents of certain lands were set apart by the crown in every parish, as the counties were then called, and good schools were established at Savannah and Augusta. When the Salzburgers settled at Ebenezer, the schoolmaster accompanied the pastor, and education walked hand-in-hand with religion. Education received the careful attention also of the Puritan colonists who settled in St. John's Parish, afterward known as Liberty county. Immediately after the conclusion of the war of the Revolution the Legislature of Georgia began to provide ways and means for the promotion of this great interest.

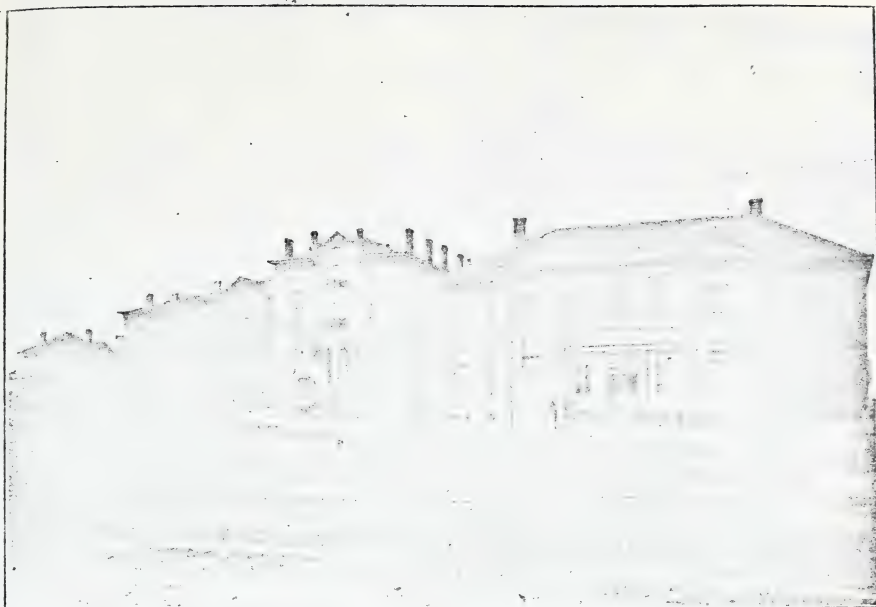
Previous to the great civil war there was no system of public schools in the State. But under the conditions then existing they were not the necessity that they now are. Private schools and academies were numerous, and were taught by excellent teachers who had to build up their schools by their fidelity to duty and ability in their profession. The greater part of the people were able to educate their children, and doing so were careful to get their money's worth by patronizing teachers who were thoroughly competent for the work undertaken. The instruction of poor children was provided for by appropriations made by the legislature, and it was frequently so well managed that the pay pupil of a school did not know who the beneficiaries were. In some of the cities there were flourishing free schools, which were sometimes presided over by teachers of such ability that the children of well-to-do parents were enrolled among the pupils.

Just before the war between the States steps were being taken for the establishment of a system of public schools. What has been done in Georgia on this line will be discussed farther on.

As far as the action of the State government is concerned the attempts to promote the cause of education in Georgia began at the top and worked downward. Immediately after the War of Independence (1784), the legislature of Georgia took measures for establishing a State University. A charter for this purpose was granted on January 29, 1785. In

November, 1801, the site was selected, and 630 acres of land, on which the flourishing city of Athens is now principally located, were sold off in lots for the benefit of the college. This land was the gift of Governor John Milledge. The first commencement exercise took place in May, 1804, on the present college campus, under an arbor formed of the branches of trees. At first the institution was partly sustained by the rent of lands given to it by the State. As this plan did not work well, the lands were all sold, and payment was made in the notes of the purchasers, secured by mortgage. By act of the legislature of December 16, 1815, the governor was authorized to advance to the trustees any amount not exceeding two thirds of the sum called for by these notes, and to receive the notes in lieu of the same. The amount agreed upon was \$100,000, but as the money was not paid, this sum was regarded as a debt due to the University by the State, and it was agreed that an annual interest of 8 per cent. should be paid upon the same. Accordingly the trustees of the University have ever since received from the State the sum of \$8,000 per annum. Other amounts have been appropriated by the State for the University as follows:

From 1830 to 1841 the amount of \$6,000 per annum, to replace losses by fire in 1830; in 1875 the sum of \$15,000 for furniture, apparatus and general outfit of the State College of Agriculture and the Mechanic Arts; a gift of \$2,000 in 1881 for the purpose of establishing free tuition, and another of \$3,000 in 1883 for repairs. In 1854 Dr. Wm. Terrell, of Hancock county, bequeathed \$20,000 to the University; in 1873 the city of Athens presented it with \$25,000 for the erection of Moore College; in 1883 Senator Joseph E. Brown gave the trustees \$50,000, invested in 7 per cent. bonds of the State of Georgia, the interest to be devoted to educating worthy young men unable to pay their way. In 1866 the State of Georgia, by legislative enactment, accepted from the government of the United States the gift of 30,000 acres of land for each senator and representative in Congress, and in 1872 Governor James M. Smith transferred the fund arising from the sale of the lands to the trustees of the University of Georgia, who, in May of the same year, opened and established the Georgia State College of Agriculture and Mechanic Arts as an integral part of the University. In 1873 the Medical College of Augusta became one of the departments of the State University.

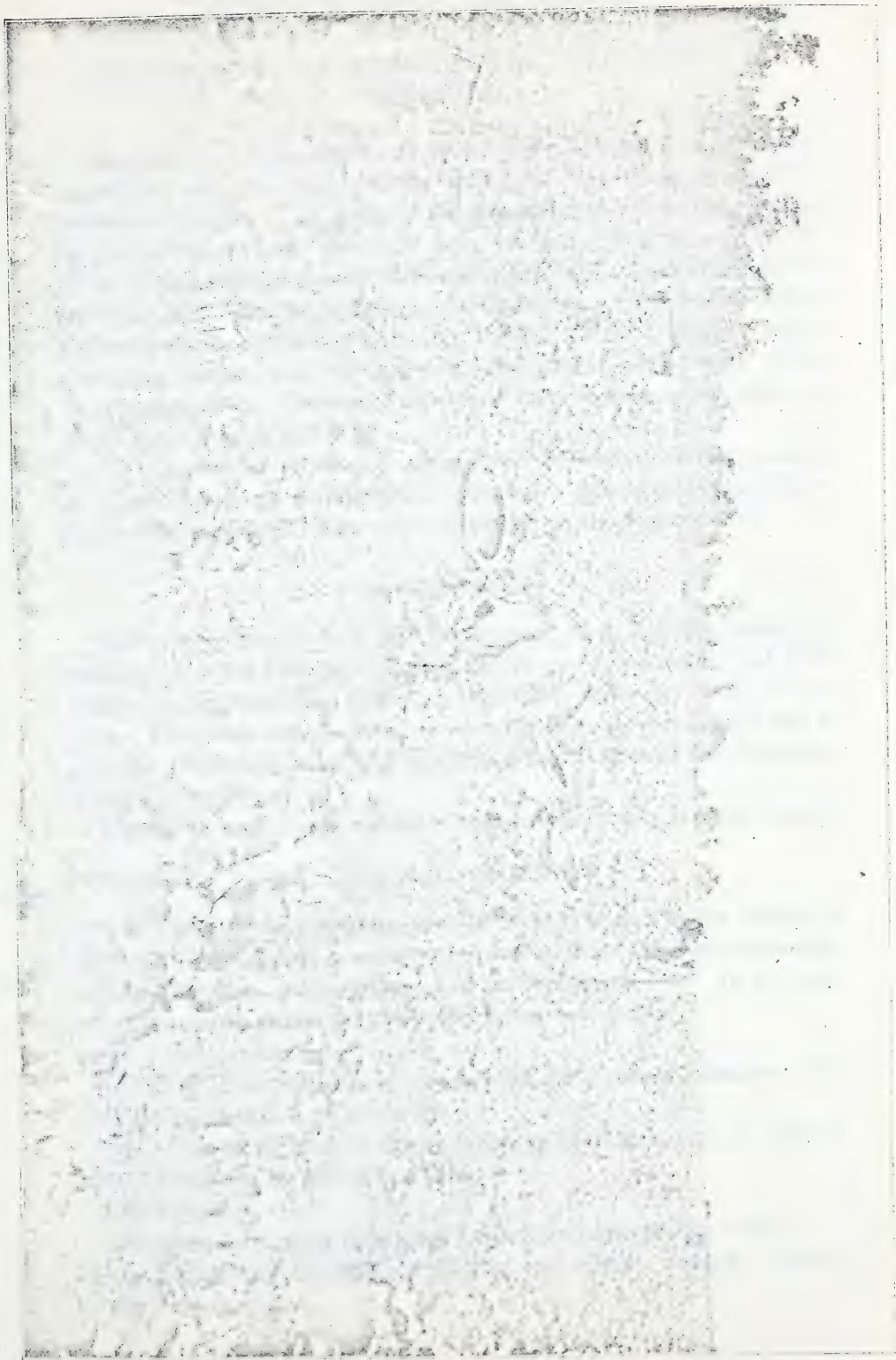


STATE NORMAL SCHOOL, ATHENS, GA.



GIRLS' DORMITORY, STATE NORMAL SCHOOL, ATHENS, GA.

GATHERING PLANS



DEPARTMENT OF AGRICULTURE, UNIVERSITY OF
GEORGIA.

The science of Agriculture and Horticulture is taught, with practical illustration and experiment, in the School of Agriculture at the University of Georgia. This is one of the Departments of the State College of Agriculture and the Mechanic Arts, which is presided over by Dr. H. C. White, and which, together with Franklin College, presided over by Dean D. C. Barrow, composes the University at Athens. The Department of Agriculture is in charge of Prof. H. N. Starnes, a native Georgian, familiar with the agricultural situation in our State. He is an alumnus of the University, and was formerly connected with the Experiment Station at Griffin.

The Trustees have recently appropriated \$5,000 to the Department of Agriculture, and it is expected that with this liberal expenditure there will be rapid development and growth in the Department.

TWO COURSES.

Two courses are given in this Department; first, the full course, extending from the Freshman through the Senior year; second, the short winter course, extending from January 1st to February 15th of each year. These two courses are fully described in the catalogues and in circulars which will be sent on application to the office of the chancellor of the University.

The following is a brief summary of the work done in the two courses:

THE FULL COURSE.

The study of the Freshman year is Botany, and is in the School of Biology. Any student otherwise prepared to enter the Sophomore class will be allowed to make up Botany in his Sophomore year. In the other years the course covers the following topics:

- (a) Plant production.
- (b) Soils (classification and composition, etc.), tillage, drainage, etc., fertilization, rotation of crops, etc.
- (c) Farm crops, each in detail, with the parallel course in Agricultural Chemistry, by Dr. H. C. White.
- (d) Spraying.
- (e) Animal Industry (breeding, feeding and care of live stock).
- (f) Agricultural Technology (butter and cheese making, canning, syrup making, etc.).

(g) Horticulture (small fruits, orchard fruits, pruning, grafting, packing, shipping, etc.).

(h) Terracing, road, bridge and fence construction.

This course, in connection with other studies (see catalogue), leads to the degree of Bachelor of Science in Agriculture.

THE SHORT WINTER COURSE.

This course, lasting for six weeks, and beginning January 1st, is intended principally for farmers' sons and others who are unable to take the full course.

No fees of any sort are required. The time is fixed at the period when such persons can best afford to be absent from the farm.

This course covers the most important topics of the full course. While the selection of subjects is limited and the treatment necessarily brief, it is believed that the students in this course will acquire the point of view which will make all the difference between the empirical and the scientific farmer.

Those who are interested in agricultural education in the State are requested to send to the office of the chancellor of the University the names of farmers' sons and others who might be interested in this course. Catalogues and other information will be sent to them.

PRACTICAL APPLICATION OF THE TEACHING.

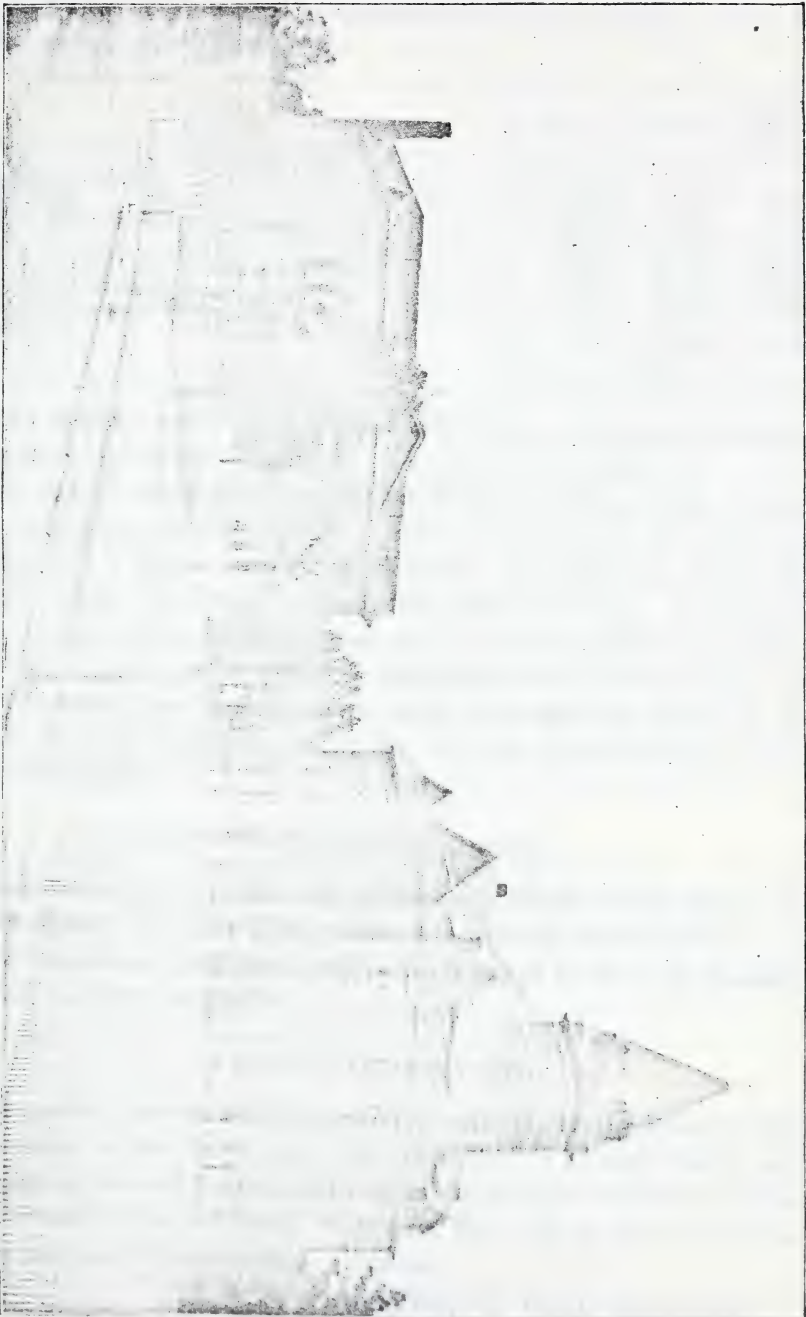
The campus, the University farm and the Agricultural Museum constitute the means for aiding the instruction, by means of illustration, observation and experiment.

1. An area of about ten acres on the campus has been set apart to the Department of Agriculture in order that the professor may have close at hand a plat of ground sufficient to illustrate, in connection with the lectures, all the processes of seed-growth, etc.

Dairying will be installed on this area on the campus, and Veterinary Science will also be introduced.

2. The Philosophical Hall has been turned over to the Department of Agriculture for the lecture room and Agricultural Museum. A full exhibit of fruits, of agricultural products, of fertilizers, of models, etc., will be made.

3. The University farm, situated beyond the corporate limits of the city of Athens, will be used to illustrate horticultural and agricultural processes on a larger scale.



GEORGIA SCHOOL OF TECHNOLOGY, ATLANTA, GA.

EXPENSES FOR THE FULL COURSE.

No tuition fee is charged residents of Georgia.

The following estimate of expenses includes all necessary items except clothing and railroad fare:

	Low.	Liberal.	Very Liberal.
Matriculation fee.....	\$ 10 00	\$ 10 00	\$ 10 00
Library fee.....	5 00	5 00	5 00
Initiation fee to Literary Society	2 00	2 00	2 00
Board.....	72 00	108 00	144 00
Fuel, room-rent, lights and attendance.....	13 00	37 00	60 00
Books and stationery	8 00	10 00	12 00
Furnishing room in dormitory	6 00	.....	.....
Laundry	9 00	12 00	14 00
	\$ 125 00	\$ 184 00	\$ 247 00

Each student, unless excused from drill because of physical disability, is required to purchase a uniform. The cost of this is \$16.00.

The figures above given are for the Freshman Class, which is more expensive than subsequent years. They are based upon the actual experience of a large number of students. Expenses are frequently brought under the lowest estimate by strict economy. Second-hand books can be purchased at low rates, and it is often possible to purchase at greatly reduced prices uniforms which have been used but little. In this and other ways money can be saved, and cases are known to the faculty where students have spent less than one hundred dollars during the entire season.

EXPENSES FOR THE SHORT COURSE.

No matriculation or other fee is charged. Board can be had in the ned Students' Boarding Hall, which is admirably conducted as a co-operative students' enterprise, under the charge of Prof. O. M. Snelling, at \$7.50 to \$8.00 per month.

FURTHER INFORMATION.

All persons interested are requested to write for catalogues or further information to the chancellor of the University at Athens; also to send the names of sons of farmers and others who may be interested in either of the courses above outlined. Circulars, etc., will be sent to all those whose names are thus supplied. Address

WALTER B. HILL, Chancellor,
Athens, Ga.

The following institutions have been established by the State and made branches of the University: The North Georgia Agricultural College at Dahlonega, Georgia School of Technology at Atlanta, Georgia Normal and Industrial School at Milledgeville, Georgia State Normal School at Athens, Georgia State Industrial School for Colored Youths.

The North Georgia Agricultural College, which was opened in 1873, is located at Dahlonega. There are no elementary students. There are two sub-Freshman classes, which prepare students for the four college classes at Dahlonega or for the University at Athens.

The Georgia School of Technology is located at Atlanta. It offers an education of high grade, founded on Mathematics, the English Language, the Physical Sciences and drawing. Degrees are offered in Mechanical, Electrical, Civil and Textile Engineering. The workshop and the textile building are important features of this school.

The Georgia Normal and Industrial College is situated in Milledgeville. Its purpose is to provide for the young women of Georgia an institution in which they may be prepared to do intelligent work as teachers according to the best known methods, or to earn their own livelihood by the practice of some one or another of those industrial arts suitable for females to follow. It also gives a full classical education.

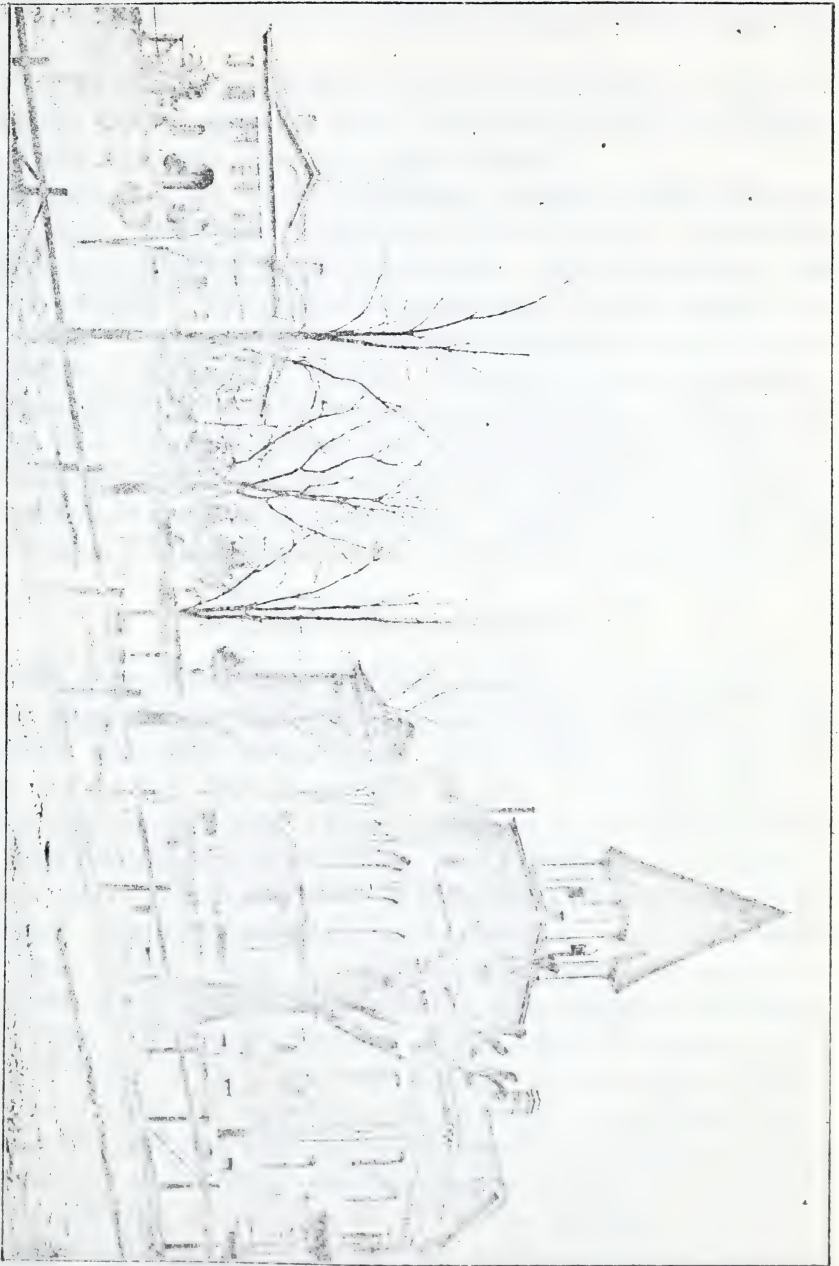
The Georgia State Normal School was first organized in Athens in 1892 as a summer school. It was permanently organized in April, 1895, and is devoted entirely to preparing teachers for work in the common schools of Georgia. It has eight departments: Civics, Latin, Elementary Science, English, Mathematics, Geography and History, Pedagogy, Free-hand Drawing and Penmanship, and a Model School for observation and practice.

The Georgia State Industrial College for Colored Youths was established by the State near the city of Savannah in 1890, for the purpose of furnishing a liberal and industrial education to colored youths. It is supported by an annual appropriation from the State and an appropriation by Congress under the Morrill Act, approved 1890. Its location is southwest of the city, about five miles from the courthouse and not far from Thunderbolt.

The following institutions are affiliated with the university, but do not now receive State funds: The South Georgia Military and Agricultural College, Middle Georgia Military and Agricultural College, and West Georgia Agricultural and Mechanical College.

The South Georgia Military and Agricultural College is located at Thomasville, and was opened in 1879.

The Middle Georgia Military and Agricultural College is located at



NORTH GEORGIA AGRICULTURAL COLLEGE, DAHLONEGA, GA.

Milledgeville. The old State capitol buildings and grounds were granted to the trustees of the State University for the purpose of establishing this college, which was opened in 1880. Military exercises form a part of the course of instruction and cadets are required to wear a uniform. A commercial course is provided for students desiring to fit themselves for business life.

The West Georgia Agricultural and Mechanical College is located at Hamilton, and was opened in 1882. The building is large and commodious with large study rooms and a spacious chapel.

The basis on which the State University is built is Franklin College, in its earliest years the only department of the university. It is still the chief classical school of this great institution. Before the days of free tuition it admitted "fifty meritorious young men of limited means" without charge, and also young men studying for the ministry of any denomination who stood in need of such aid. There are in the university library at Athens many thousand choice volumes, of which about 1,000 were the gift of Hon. George R. Gilmer, for four years governor of the State. There are also several thousand volumes in the libraries of the two literary societies of the University at Athens. Another department of the University at Athens is the Law School, presided over by an able faculty.

OTHER NOTED COLLEGES.

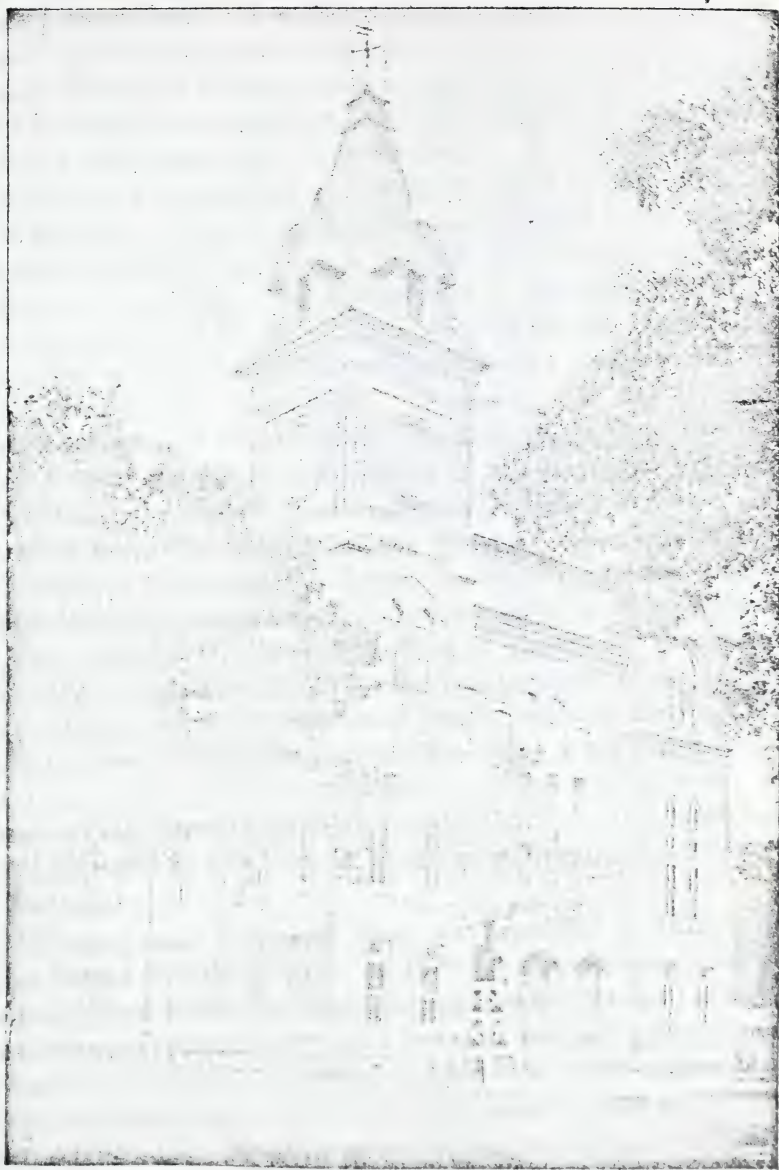
Emory College at Oxford, in Newton county, is the joint property of the North Georgia, South Georgia and Florida conferences of the Methodist Episcopal Church, South. It was chartered December 29, 1836, and the first class was graduated in 1841. The college has from time to time, received gifts of money, specimens for its mineral cabinet and books for its library, which contains twenty thousand choice volumes. Each of the two literary societies has about three thousand volumes in its library. One of the early donations to the college was a fund of \$5,000, given by Mr. George W. Williams, a Georgian, who moved to Charleston, South Carolina, and became one of the prosperous merchants of that city. During the presidency of Dr. Atticus G. Haygood Mr. George I. Seney, of New York, made to Emory College a gift of \$125,000, part of which was expended in the erection of the building known as Seney Hall, and part added to the endowment of the college. Under the presidency of Dr. W. A. Candler, the sum of \$100,000 was added to the endowment, of which Mr. W. P. Pattillo, of Atlanta, gave \$25,000. The handsome new library building, known as Candler Hall, was erected at a cost of \$25,000. It has ample room for 75,000 volumes.

The founder and first president of the college was Ignatius A. Few. Three of its presidents, Drs. George F. Pierce, Atticus G. Haygood and Warren A. Candler, were elected bishops of the Methodist Episcopal Church, South. This institution bears a high reputation for its thorough instruction, and for making higher education possible to young men of limited means through its helping halls, loan fund and other agencies. There is connected with the college a school of law, presided over by Judge Capers Dickson. There is also a department of Pedagogy. The mineral cabinet is very large, containing thousands of specimens collected during the last fifty years. The museum contains an interesting collection of objects of historical interest.

Mercer University, located at Macon, the "Central City" of Georgia, is under the control of the Georgia Baptist Convention. At its organization in the town of Penfield in 1838 it was called Mercer Institute. Its curriculum was soon after extended and its name was changed to Mercer University. In 1870 it was removed to Macon, new and handsome buildings were erected, and its entire equipment was greatly enlarged and improved. The libraries of the university and of the two literary societies contain many thousands of well-selected volumes. In addition to a regular collegiate course there is connected with this institution a school of law, presided over by Judge Emory Speer. Important feeders of the University are Mercer High School at Penfield and Crawford High School at Dalton. The university has in all ten buildings. The main building, which is four stories high, was erected at a cost of \$100,000. In this is the president's residence and office, several lecture rooms, the geological museum, chemical laboratories, apparatus rooms, the literary society halls and their libraries. The chapel building, also four stories high, has six large lecture-rooms, also the biological museum and laboratory. In the rear of this building and forming a part of it is the chapel, capable of seating eight hundred people. In the rear of the chapel and connected with it is the university library with a capacity of 20,000 volumes. There is also the gymnasium, a large, new brick building. There are two boarding halls and six frame dormitories for students.

There is a fund for the education of young ministers of limited means. There is also a loan fund secured through a bequest of the late M. Aquilla Cheney, supplemented by gifts of other friends of the college.

The Wesleyan Female College at Macon enjoys the high honor of being the first college in the world chartered for the express purpose of bestowing diplomas upon ladies. It is the property of the North and South Georgia and Florida Conferences of the Methodist Episcopal Church, South. It was chartered December 10, 1836, as the Georgia



SENEY HALL, EMORY COLLEGE, OXFORD, GA.

Female College, and was built by general subscription, Methodist ministers acting as agents for the collection of the necessary funds. Its first president was Dr. George F. Pierce, afterwards a bishop of the Methodist Episcopal Church, South. The first class was graduated in 1840. A mortgage of ten thousand dollars against the college was paid off in 1845 by James A. Everett of Houston county, who then presented the property to the Georgia Conference of the Methodist Episcopal church, South, by whom its present name was conferred upon it. In 1881 Mr. George I. Seney, of New York, donated to it \$50,000 which he afterwards increased to \$125,000. Most of this donation was expended on the enlargement of the college building. About \$35,000 of it forms a permanent endowment of the college. This enlargement of the college occurred during the presidency of Dr. W. C. Bass, who was for more than thirty years identified with the work of the college, first as a professor, and for more than twenty years as president. The Seney gift was bestowed through the influence of Dr. Atticus G. Haygood, at the time president of Emory College and subsequently bishop of the Methodist Episcopal Church, South. In 1894-95 a well-equipped chemical laboratory for practice work was added through money raised by the efforts of Professors Charles O. Townsend and Joseph T. Derry. In 1900 a handsome brick building, four stories high and complete in all its appointments, was erected at a cost of \$25,000 and named by the trustees "Roberts Hall" in honor of Dr. J. W. Roberts, president of the college, to whose management the Institution is largely indebted for its recent rapid advancement. The lower floor is taken up by seven rooms for the Science Department, which is up-to-date in all its appointments. Its new chemical laboratory, physical apparatus and mineral cabinet have been well arranged by the head of the Science Department, Professor W. B. Bonnell.

The Shorter Female College at Rome was organized in 1873 as the Cherokee Baptist Female College. In 1877 the property was purchased by Colonel Alfred Shorter of Rome, who determined to use his money for the equipment and endowment of a first-class college for young ladies. He accordingly employed a skillful architect and erected three large buildings, equipped them with the necessary apparatus, and liberally endowed the institution. He then presented the property to the Baptists of Georgia as a "gift to our daughters," to be used exclusively as a college for young ladies. This institution rightly bears the name of the noble-hearted gentleman who was its greatest benefactor. In all the South there are no more beautiful school edifices than the graceful buildings crowning a lofty eminence in the city of Rome. The college

possesses a fine equatorial telescope, and excellent chemical and biological apparatus. It also has a large and finely equipped gymnasium.

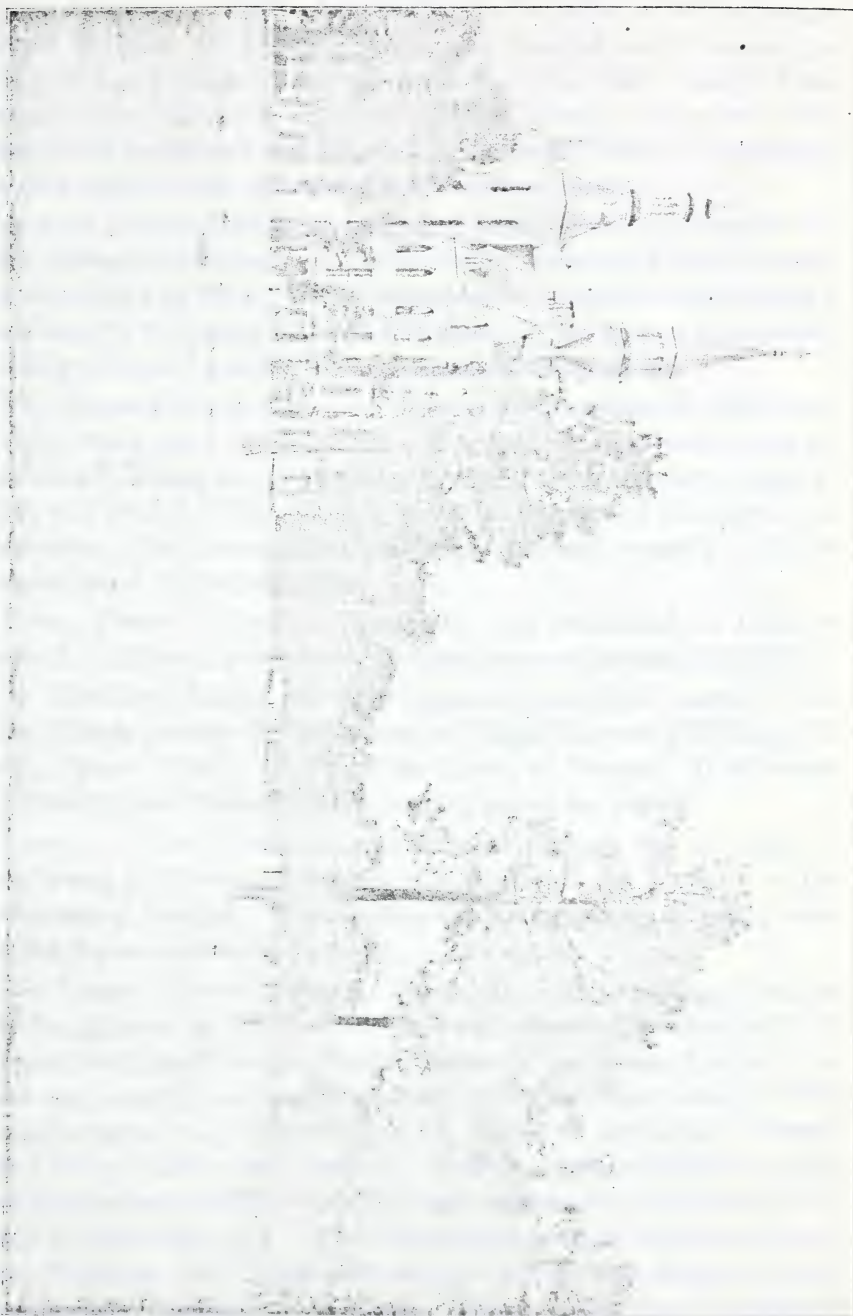
The Agnes Scott Institute at Decatur, eight miles east from the city of Atlanta, began its career in a rented building, September, 1889, under the auspices of the Decatur Presbyterian Church. In the following spring Colonel George W. Scott, an elder of the church, purchased five and a half acres and proposed to provide a permanent home for the school. His first gift was \$40,000, which, by the time the work was completed, he had increased to \$112,500. For this splendid property Colonel Scott delivered deeds to the board of trustees, and in the presence of the Synod of Georgia it was dedicated to the cause of the Christian education of young women, November 12, 1891. The trustees, in recognition of Colonel Scott's noble gift, gave to the institution the name of his mother, Agnes Scott. He has since given to this college \$8,000 more, making his total gift \$120,000.

The Lucy Cobb Institute, located at Athens, was first opened to the public in 1858. This flourishing ladies' college was founded through the efforts of General Thomas R. R. Cobb. Just about the time of the opening of the school, Lucy Cobb, eldest daughter of General Cobb died, and the trustees unanimously decided to name the new college in honor of her, the daughter of its founder. The main building is a convenient and elegantly arranged home for young ladies. When the necessity arose for a new college chapel, many contributions were made by friends in Georgia and elsewhere, of from five to five hundred dollars. General Henry R. Jackson, of Savannah, Georgia, was one of the most liberal contributors. As more money was still needed, one of the young lady pupils wrote a beautiful and girlish letter to Mr. George I. Seney, of New York, whose gifts to Emory and Wesleyan Colleges had made his name familiar in Georgia. He responded with a liberal gift, and Seney-Stovall chapel stands as a monument to the noble gentleman of New York and fair daughter of Georgia.

The Southern Female College (Cox College) for young ladies is a Baptist institution located at College Park, about eight miles southwest from Atlanta. The buildings are elegant and are furnished with all modern conveniences. They are also fully equipped with the apparatus deemed necessary for a first-class college.

The Southern Female College at LaGrange is the property of the Baptist denomination. It was organized in 1843, and has always enjoyed a fine reputation. The old college buildings have been lately replaced by elegant new ones of modern style and are well equipped for college work.

MERCER UNIVERSITY, MACON.



The LaGrange Female College began its existence as the LaGrange Female Academy in 1833. In 1836 it was chartered as the LaGrange Female Institute. In 1852 its charter was amended and it became LaGrange Female College. It is the property of the North Georgia Conference of the Methodist Episcopal Church, South, having been tendered to the conference and accepted in December, 1867. It is among the most noted of the educational institutions of Georgia.

Andrew Female College at Cuthbert, which is the property of the South Georgia Conference of the Methodist Episcopal Church, South, was established in 1853. It has ever since its foundation been doing a good work for the young ladies of that section of the State. A large new building will soon be added to the equipment of the college.

The Monroe Female College at Forsyth was chartered in 1849, and in 1850 was opened to the public. It is held in high esteem, and its handsome buildings are an ornament to the thriving and pretty town in which it is located. This school is under the auspices of the Baptist denomination. Two commodious buildings have been recently added to the equipment of this institution.

Young Female College at Thomasville was established in 1868 by Major E. R. Young, who donated for that purpose the sum of \$30,000.

St. Stanislaus College was first organized under the name of Pio Neno College, mainly by the efforts of Right Reverend William H. Gross, Roman Catholic Bishop of the diocese of Georgia. It is located at Vineville, near Macon, and is a training school for priests.

Young L. Harris Institute was founded through the liberality of Mr. Young L. Harris of Athens, who presented the property to the Methodists of Georgia. It is a college for young ladies and young men, and is doing a noble work.

The Brenau Female College at Gainesville is the outcome of an institution founded by Dr. W. C. Wilkes and a board of trustees in 1878, called at first the "Georgia Baptist Seminary for Young Ladies." In 1886 the property was bought by Prof. A. W. VanHoose who, in 1893, formed a partnership with Prof. H. J. Pearce of Columbus, Georgia. These two gentlemen have built up a first-class college which was their own property until 1900, when they sold an interest in it to Dr. M. M. Riley of Greenville, S. C. The name of the college was changed soon after Professor Van Hoose took charge of it to the Georgia Female Seminary and Conservatory of Music. Brenau is the name just adopted for this institution with its greatly enlarged facilities.

The Piedmont Institute at Rockmart, founded in 1889, is doing

a fine work for the boys and girls of Northwest Georgia. It is the property of the North Georgia Conference of the M. E. Church, South.

The South Georgia College at McRae, the property of the South Georgia Conference of the M. E. Church, South, is also doing good service in the cause of education.

For the Colored people of Georgia there are also several institutions.

The Atlanta University for the education of negroes was established in 1867 by the Freedmen's Bureau and various Northern Aid Societies, the chief of which was the American Missionary Association.

Clark University at Atlanta was chartered in 1887 for the same purpose.

The Georgia State Industrial College for Colored Youths at Savannah has already been mentioned as a department of the State University, supported by the State.

Payne Institute at Augusta, is a school for the colored people under the auspices of the M. E. Church, South.

Other institutions for the education of the negroes are:

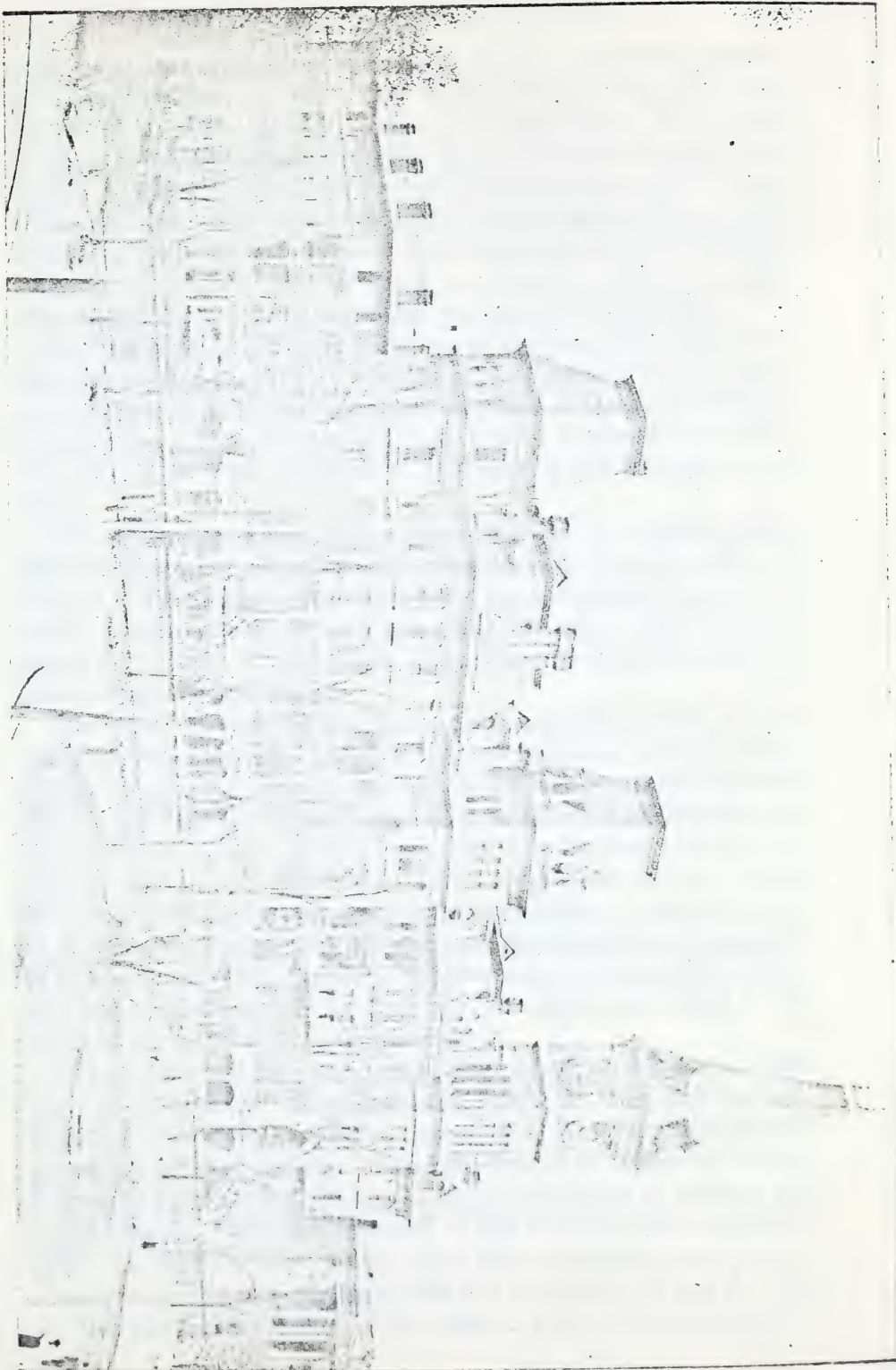
Spellman Seminary, Morris Brown College and Gammon University, all in Atlanta.

In addition to the institutions of learning before mentioned, Georgia has many schools enjoying a fine reputation. Two of the oldest schools in the State are the Chatham Academy of Savannah and the Academy of Richmond county, in Augusta, each dating back to old colonial days. Both of these are now part of the public school systems of their respective cities.

PUBLIC SCHOOLS.

Last, but not least, is the great public school system of Georgia. The State Constitution of 1868 made provision for "a thorough system of general education, to be forever free to all children of the State." At a meeting of the Georgia Teachers' Association held in Atlanta in August, 1869, a committee was appointed to report upon a school system adapted to the condition and wants of Georgia. The committee consisted of Professor Gustavus J. Orr, for many years professor of Mathematics in Emory College, chairman; Bernard Mallon, long the superintendent of the public schools of Savannah, and afterwards of Atlanta; John M. Bonnell, then president of Wesleyan Female College at Macon; Martin V. Calvin of Augusta, and David W. Lewis, president of the North Georgia Agricultural College at Dahlonega. By direction of the committee the chairman prepared the report, which was then submitted to the ex-

WESLEYAN FEMALE COLLEGE, MACON, GA.



cutive committee composed of Rev. H. H. Tucker, at one time president of Mercer University and later of the State University; Prof. W. Leroy Browne of the State University; Rev. Alexander Means, D.D., long a professor in Emory College; Professor W. D. Williams, principal of the Georgia Academy for the Blind; Professor Bernard Mallon, and Professor Gustavus J. Orr. After nine hours spent in discussing the report, section by section, it was adopted as written. At another meeting of the Georgia Teachers' Association, held at Macon in November, 1869, the report after being discussed for an entire day was unanimously adopted.

That report forms the main provisions of the first public school law, approved October 13, 1870. Under this act an organization was effected, and Governor R. B. Bullock appointed General J. R. Lewis State School Commissioner. This office has since been held by Professor Gustavus J. Orr, Hon. J. S. Hook, Professor S. D. Bradwell and Professor G. R. Glenn.

It is appropriate to state in this connection that at a meeting of the National Educational Association, a committee raised for the purpose of forming an ideal school system for a State, and composed of some of the ablest educational men of the Union, with the school laws of all the States before them, in their report followed to a remarkable extent the public school law of Georgia.

The system of common schools, though organized in 1870, did not really go into effect until 1873. There was a common school commissioner, and a tax for the support of schools had been levied and collected. Schools had been put into operation in some counties and teachers employed; but at the close of 1871 more than three hundred thousand dollars was due to school officers and teachers for services rendered. There was nothing with which to pay them; for, in violation of the Constitution of the State, the fund of \$327,000 had been appropriated to the payment of legislative and other expenses of the government. In vain did teachers and school officers clamor for their pay, for there was nothing to the credit of the school fund in the treasury.

It was feared that the system had received a fatal blow in the very first years of its existence. No schools were taught in 1872, and the commissioner devoted his attention to systematizing the work under the law passed in August of that year. The legislature of 1872 provided for the levying of a tax for the purpose of paying the claims of teachers and school officials. Under the operation of this law the debts were finally paid. In 1873 the schools were again put in operation, and have increased in number and efficiency from that day to this. From the time of Governor Smith's induction into office in 1871 to his retirement in

1877, the amount of \$1,271,368 was raised for the support of the public school system, out of which the debts to teachers and school officers were paid, besides meeting promptly the expenses of running the schools.

In 1871 the total attendance on the public schools of Georgia was 49,578, and in 1876 it was 179,405. For the year 1877 Professor Orr, the State School Commissioner, reported the attendance on the public schools to be in round numbers 200,000.

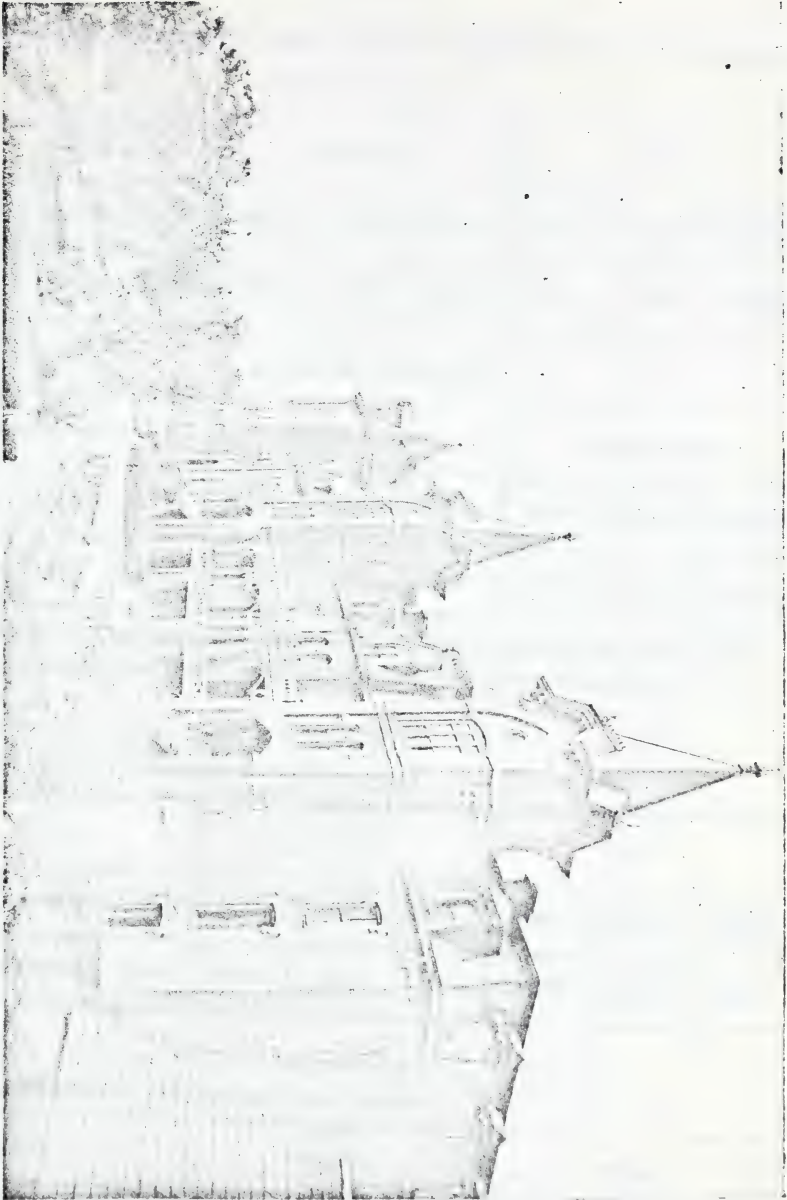
The report of Commissioner G. R. Glenn for the year 1899 showed a total enrollment of 416,352 pupils in the public schools of Georgia. Of this number 247,912 were white and 168,440 were colored.

The amount apportioned and paid for the support of the public schools in Georgia for 1900 is \$1,440,642. To this should be added \$400,000 paid by local city and county appropriations.

By a school census taken by the State School Commissioner in 1893 it was ascertained that the number of children in Georgia between the ages of ten and eighteen, who were unable to read and write, was 114,527. Of this number 35,638 were white, and 78,884 were colored. A similar census in 1898 showed the number unable to read and write between the ages of ten and eighteen to be 83,616. Of this number 22,917 were white and 60,699 were colored. This shows a gratifying decrease in the number of illiterates in Georgia. From the report of Commissioner Glenn rendered October 1, 1900, it appears that there were in Georgia 5,866 white teachers and 3,113 colored, a total of 8,979. The number of pupils enrolled during the year was 251,093 whites and 172,374 colored. The average daily attendance was 151,341 whites, about 60 per cent. of the enrollment; and 101,852 colored, or about 59 per cent. of the enrollment.

Among other prominent schools of Georgia are: Douglasville College, Douglasville; J. S. Green College, Demorest; Martin Institute, Jefferson; Wynton Male and Female College, Columbus; South Georgia Male and Female College, Dawson; Gordon Institute, Barnesville; Dalton Female College, Dalton; Monroe Female College, Monroe; South Georgia College for both sexes, McRae; Chappell Female Institute, Columbus; Georgia Military Academy, College Park; New Ebenezer College, Cochran; Hiawasse High School and the North Georgia Baptist College, at Morganton.

The following tables give valuable information concerning schools of all kinds in Georgia:



SHORTER COLLEGE, ROME, GA.

TABLE 1.

SCHOOLS BELONGING TO THE PUBLIC SCHOOL SYSTEM OF GEORGIA.

NUMBER OF TEACHERS.

WHITE.			COLORED.			TOTAL.		
Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Grand Total.
2851	3015	5866	1317	1796	3113	4168	4811	8979

GRADES OF TEACHERS.

FIRST GRADE.			SECOND GRADE.			THIRD GRADE.		
White.	Colored.	Total.	White.	Colored.	Total.	White.	Colored.	Total.
2970	417	3387	1594	886	2480	983	1661	2644

Number of normal trained teachers—White, 1277; colored, 341; total, 1618.
SCHOOLS—Number of white schools, 5045; colored, 2710; total, 7755.

ENROLLMENT.

Number of pupils admitted during the year:

WHITE.			COLORED.			TOTAL.		
Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Grand Total.
129778	121315	251093	81486	90888	172374	211264	212203	423467

ATTENDANCE.

Average number of pupils in daily attendance:

WHITE.			COLORED.			TOTAL.		
Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Grand Total.
76067	75274	151341	47024	54828	101852	122463	130102	253493

MONTHLY COST—Average monthly cost per pupil.....\$1 13
Amount of average monthly cost paid by the State..... 96

TABLE 1—*Continued.*

TEACHERS' SALARIES.

Average monthly salaries paid teachers:

FIRST GRADE.		SECOND GRADE.		THIRD GRADE.	
White.	Colored.	White.	Colored.	White.	Colored.
\$ 35 31	\$ 25 80	\$ 26 30	\$ 20 76	\$ 20 70	\$ 16 65

Number of visits made by the commissioners during the year..... 9,383

Number of schoolhouses in the State belonging to the county boards of education, 5,779; value \$1,430,288 43

Number of schoolhouses in cities and towns not belonging to the county boards, 527; value. 1,868,264 00

FINANCIAL STATEMENT—Receipts for the year:

Balance in hand from 1898..... 42,423 20

Amount treasurer's quarterly checks..... 1,268,885 30

Amount from any and all other sources, including supplemental checks 150,959 03

Total receipts..... 1,462,267 53

EXPENDITURES:

Salary of county school commissioners..... 62,074 50

Salary of members of boards of education..... 10,827 41

Postage, printing and other incidentals.. 16,282 97

Amount expended in the purchase of school supplies and buildings..... 71,628 67

Amount paid to teachers 1,235 868 36

Total 1,396,681 91

Balance remaining on hand 65,885 62

Total amount of salaries credited to teachers during the year, as per itemized statements..... 1,318,512 25

Number of school libraries, 183; value, \$32,802.31.

TABLE 2.

ENROLLMENT IN PUBLIC SCHOOLS UNDER LOCAL LAWS.

Pupils in Schools for Whites.	Pupils in Schools for Negroes.	Total.
35,856	23,340	59,196

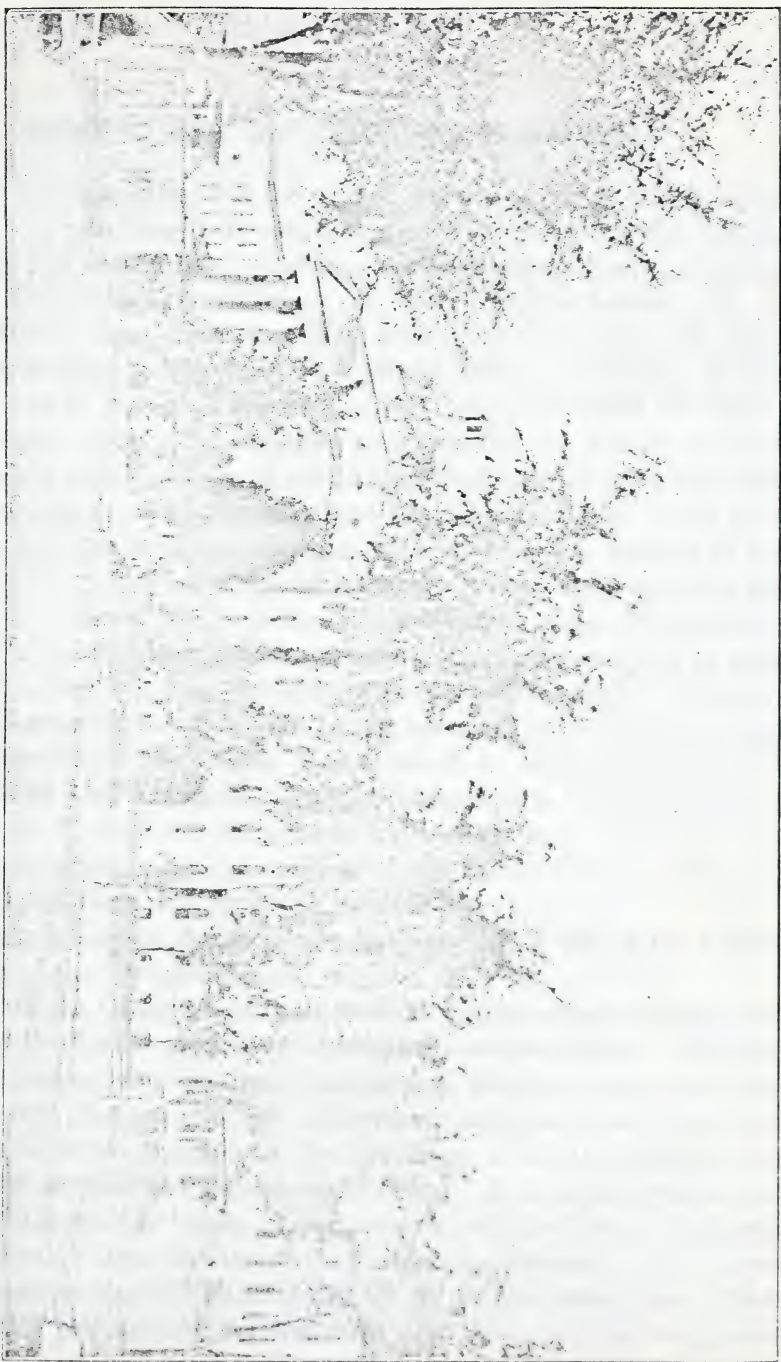
From the total should be deducted 8,202 already counted in the county schools.

TABLE 3.

PUPILS ENROLLED IN PRIVATE HIGH SCHOOLS AND COLLEGES.

In those for Whites.	In those for Negroes.	Total.
10,097	4,877	15,974

-All these tables are made up from the report of the State School Commissioner, G. R. Glenn, submitted on October 1, 1900.



STATE SANITARIUM, MILLERSVILLE.

CHAPTER XIV.

BENEVOLENT INSTITUTIONS OF GEORGIA.

"Not for themselves, but for others" was the motto of the founders of Georgia, who gave their time and money for promoting the welfare of those who needed help, expecting no other reward than that which arises from the consciousness of duty well-performed. It is not strange, then, that the first benevolent institution of Georgia had its birth in the early days of the colony. This was Whitefield's Orphan House at Bethesda, about nine miles from Savannah, founded in 1739. The building was erected by funds collected through the untiring efforts of the distinguished minister in whose honor it was named. Of this noble enterprise Mr. Whitefield said, "Some have thought that the erecting such a building was only the product of my own brain; but they are much mistaken; for it was first proposed to me by my dear friend, the Rev. Mr. Charles Wesley, who, with his excellency General Oglethorpe, had concerted a scheme for carrying on such a design before I had any thoughts of going abroad myself." This giving of due credit to others adds to the honor of the founder and first superintendent of the Orphan House, which he called Bethesda, "because," said Mr. Whitefield, "I hoped it would be a house of mercy to many souls." And such it has been, and is still. It is a home for boys and is conducted under the auspices of the Union Society, which last year (1900) celebrated its 150th anniversary.

The State Lunatic Asylum, near Milledgeville, is one of the noblest charities of the "Empire State."

In 1837 the Georgia legislature made an appropriation and appointed a commission for the purpose of establishing a lunatic asylum. The commission bought for a small price 40 acres of pine land two miles from Milledgeville, located on a high hill commanding a fine view of the town and the intervening country. In December, 1842, the building was completed and the first patient was admitted. At first the counties had to pay the expenses of their pauper patients, and the friends of patients who were able to pay had to provide for their maintenance in the asylum. This plan was changed to State care of the pauper insane about 1846. Up to 1877 patients were received from other States. At that time, on ac-

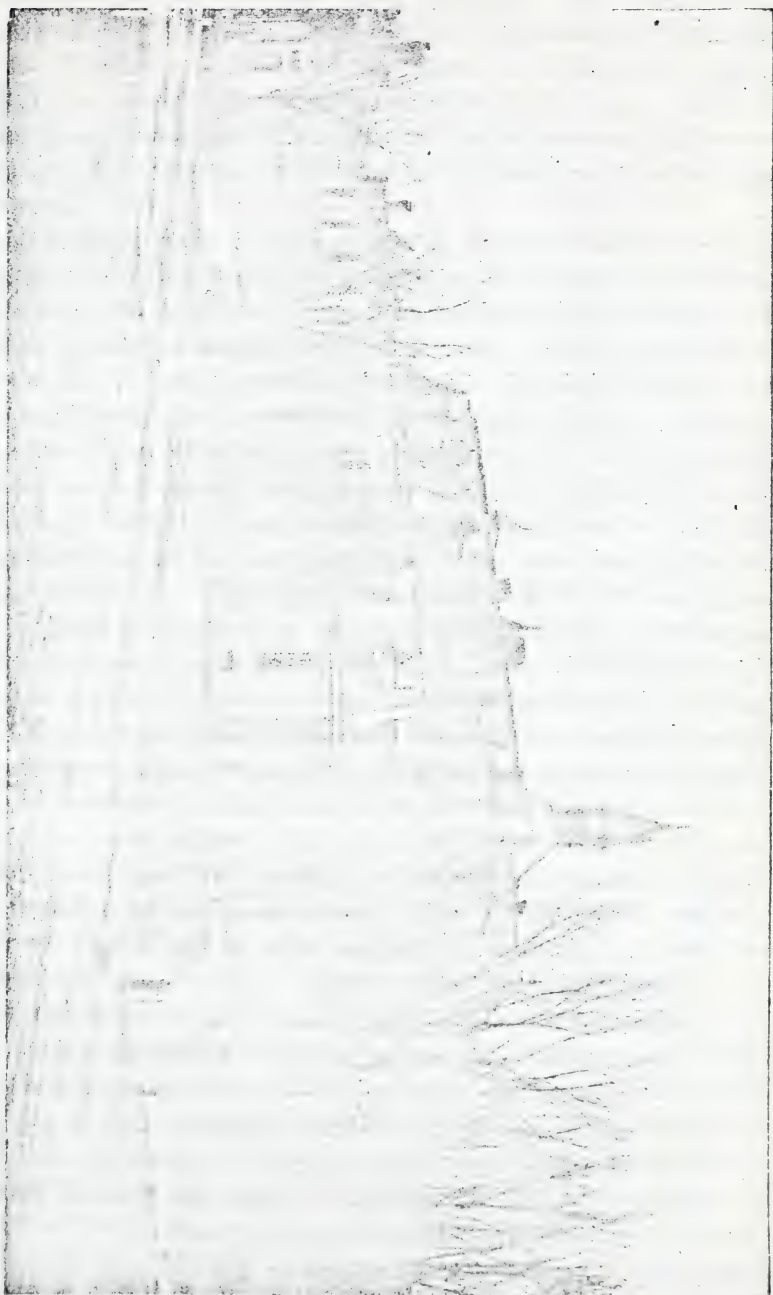
count of the overcrowded condition of the institution, the General Assembly was obliged to pass an act sending all patients not citizens of Georgia to their respective States. During the same year an act was passed making the asylum free to all *bona fide* citizens of Georgia. By the same act it was provided that friends could deposit with the steward funds for extras to be used by the patients individually, but no part of this was to go to the support of the institution. The first superintendent was Dr. David Cooper, elected in 1843. Three years later Dr. Thomas F. Green, a man of kindly nature, genial manner, and of great enterprise and energy was elected. He succeeded in obtaining appropriations year after year, in making improvements and in securing a suitable corps of attendants. He remained in charge of the asylum until 1879 when in a peaceful old age and still possessed of all his faculties, he suddenly expired. He was succeeded by Dr. T. O. Powell who had been associated with him for nearly twenty years.

In 1847 the legislature added another building to the original one, and the female patients were placed in the new building. White attendants were also substituted for negroes, who had formerly discharged this duty. In 1849 plans were approved by the legislature for greatly enlarging the asylum accommodations. The legislature appropriated \$10,500, and in 1851 added \$24,500 for a large and handsome new building. To this the original buildings were to be wings. Additional appropriations were made as follows: \$56,500 in 1853; \$110,000 in 1855; \$63,500 in 1857, and \$30,000 in 1858, in which year the building was completed.

The building is supplied with every convenience for the comfort of the patients and of the officers and their families. In 1870 and 1871 another appropriation of \$105,855 was voted for enlarging the main building. In 1881, at the urgent solicitation of the board of trustees, the legislature appropriated \$165,000 for the erection of two separate buildings for white convalescents, one for males, the other for females. In 1883 an additional appropriation of \$92,875 was made, and in 1893 the legislature voted \$100,000 more for the erection of additional buildings for white and colored insane.

The emancipation of the negro population in 1865 necessitated asylum accommodations for the insane of this race. In 1866 the legislature appropriated \$11,000 for an insane asylum for negroes. This building was enlarged in 1870 at an expense of \$18,000. In 1879 the legislature appropriated \$25,000 more for the same purpose, and in 1881 the sum of \$82,166 for a new building and heating apparatus for the insane of the colored race. Of course the erection of all these large buildings required much more land than was embraced in the original

GEORGIA SCHOOL FOR THE DEAF, CAVE SPRING, GA.



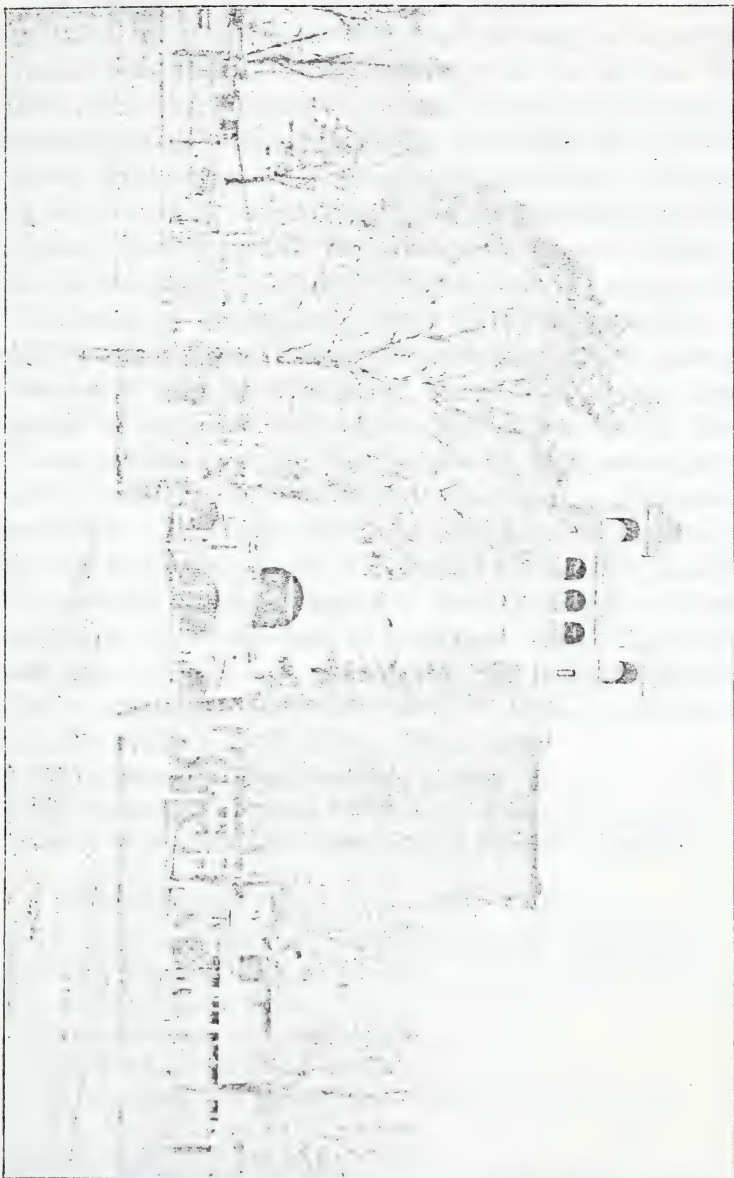
purchase. The institution now has 3,000 acres in one body. The asylum has its own water works, the water being furnished from a bold stream on its own grounds. It has also a well 960 feet deep, much of it through solid rock. With the exception of the capitol in Atlanta, the center building of the asylum is the handsomest edifice in Georgia. About a mile from the asylum proper is the hospital for the treatment of contagious diseases. The total cost of the land and buildings is more than one million dollars.

Georgia Institute for the Deaf and Dumb. At the beautiful town of Cave Spring, not far from the city of Rome, in a charming valley between mountains and hills, stand the commodious and substantial buildings of the Georgia Institution for the Deaf and Dumb. No more appropriate location for such an institution could be found. The legislature of the State has at different times made liberal appropriations for the education of the deaf and dumb. Before Georgia had an institution of her own for this purpose a commissioner was appointed to receive application in behalf of indigent deaf and dumb residents of the State, and to make all necessary arrangements for conveying them to the American Asylum at Hartford, Connecticut. For this purpose the sum of \$3,000 was appropriated. Later the State made an arrangement for educating deaf mutes at the Hearn Manual Labor School, at Cave Spring, in Floyd county, Georgia. In 1847 the legislature passed an act authorizing the governor to appoint five commissioners, whose duty it should be to make all necessary arrangements for the erection of an asylum for the deaf and dumb. In 1849 the necessary buildings had been provided, and the institution was opened for pupils in July. Here deaf and dumb children and some of more advanced years have been taught by the most approved methods. The first building, of brick, was erected in 1849. In 1850 an easterly extension was added, and in 1875 another on the south. A shop two stories high was also erected. Another brick building, known as the dormitory was erected in 1878, and in 1882 the north extension to the main building was added for the use of the principal and his family. During this same year a department for negro deaf mutes was opened in a building of brick, purchased for the purpose and located about 250 yards from the dormitory building for whites. In 1885 the present handsome school building was begun. It was completed and occupied in 1889. In 1887-88 the dormitory was enlarged by putting upon it a handsome mansard roof. In 1890 an engine-house and laundry were added with all necessary appliances, also a 500-gallon steam pump. Six-inch water mains were laid, with ten Ludlow fire plugs conveniently located; hose carriage and 700 feet of fire department hose were purchased and

steel stair fire-escapes were erected where needed. In 1894 a new and handsome building was erected for shop purposes. This building has been equipped for a general line of wood-working; also a well-arranged printing office; a shoe shop; a blacksmith shop and wood-carving department. In 1897 the sum of \$7,000 was spent in electric lighting and in steam heating. There is also a well-equipped art studio in the school building. The buildings are situated in the eastern part of the town of Cave Spring and command a fine view of Van's Valley and its picturesque scenery.

The Academy for the Blind is another of the institutions of Georgia established and supported by the State. It is located in the city of Macon on College Hill. This institution was incorporated by act of the legislature, January 2, 1852. It originated in a movement made by the citizens of Macon at a meeting called for this purpose on April 15, 1851. Mr. W. S. Fortescue was the first principal, and Miss Hannah Guillan was assistant teacher. For the years 1852 and 1853 the legislature appropriated \$5,000 per annum to aid in the support of the institution. On February 18, 1854, the legislature appropriated \$10,000 for the erection of a suitable building. Further appropriations were made and in 1860 the main building facing Orange street was completed at a total cost of \$65,000. The average of the annual appropriations up to 1876 was about \$13,000. For the year ending October 1, 1899, the appropriation from the State was \$18,500. Additions were made to the main building in 1893, and a handsome boy's dormitory was added several years later. The entrance to this is from College street. A two-story brick building in which are the workshops faces Orange street. In 1882 a department for the colored blind was opened and a large and comfortable brick building facing Madison street was erected. This is under the same management as the white department, but the two are on lots distant from each other. In August, 1858, Professor W. D. Williams was elected principal and retained this office until his death, December 20, 1898. His son, Dudley Williams, was elected his successor, and upon his resignation in 1901 was succeeded by Mr. T. U. Conner.

The Female Asylum at Savannah is one of the oldest of the benevolent institutions of Georgia. On the 17th of September, 1801, several of the prominent ladies of Savannah met for the purpose of organization, and Mrs. Ann Clay was called to the chair. Fourteen lady managers were elected, and the following officers of the asylum were chosen. Mrs. Elizabeth Smith, first directress; Mrs. Ann Clay, second directress; Mrs. Jane Smith and Mrs. Sarah Lamb, secretaries; Mrs. Margaret Hunter, treasurer.



ACADEMY FOR THE BLIND, MACON, GA.

This institution is supported by annual subscriptions and has received many valuable bequests. Its business is managed by a board of directors who meet once a month. A visiting committee is appointed to purchase the necessary food, such as groceries, and clothing. The house is under the direction of a matron, second matron and teacher.

The Augusta Orphan Asylum was incorporated in January, 1852. In 1855 a house was rented and placed in charge of a matron, and four orphans were admitted to the privileges of the asylum. Mr. Isaac S. Tuttle, who died December 12, 1855, bequeathed his home on Walker Street and other property amounting to \$50,000 for the use of the association. This gift, added to the annual income from 200 shares of Georgia Railroad stock, provided amply for the institution in its infancy. For seventeen years the Tuttle House was occupied as an Orphan home. On the 9th of January, 1859, Dr. George M. Newton, stepson of Mr. Tuttle, died leaving to the asylum property valued at \$200,000. In 1869 an eligible site between Harper and Boundary streets, near the western boundary of the city of Augusta, was selected, mainly through the influence of Dr. Lewis D. Ford, the second president of the association. An elegant home was here built by Mr. W. H. Goodrich after plans furnished by Mr. D. B. Woodruff. It was begun in December, 1870, and completed in December, 1873. In 1889 this building was destroyed by fire, but was rebuilt by Mr. Charles B. Allen, after plans furnished by Mr. Lewis F. Goodrich, the son of the builder of the old home. It was reoccupied by the children in December, 1890. There are connected with this institution a farm and dairy, which made for the year ending April 1, 1900, a net profit of \$2,636.77. More than \$1,400 of this came from the products of the dairy. These were.

5,023 gallons of milk at 20 cents a gallon	\$1,004 60
1,330½ pounds of butter at 30 cents a pound	399 15
68 loads of compost from cow yards at 50 cents a load.....	34 00

Total dairy products\$1,437 75

The farm supplied the following values at market prices:

Potatoes, corn and other vegetables	\$503 25
578 watermelons at 5 cents each	28 90
1267 cantaloupes at 3 cents each	38 01

And the following field crops:

Oats, rye, vetch and green feed	98 00
25 tons of cured oats at \$15 a ton	375 00
15 tons of peavine hay at \$13 a ton	195 00
Corn and fodder	30 00

Total value of products\$2,705 91

Purchased during year seven cows	\$234 00	
Sold five cows	\$130 70	
Butchered four calves weighing		
243 pounds at 12c. a pound....	29 16	
Sold one calf	5 00	—\$164 86
	Debit	\$ 69 14
Debit		\$ 69 14
		<u>\$2,636 77</u>

The larger boys of the home have their hours for school, for work on the farm, and for recreation. The girls have their hours for school, for work in the cutting, fitting and making department, and for recreation. They also take their turn at cooking and general housework.

The Orphan Home of the North Georgia Conference of the Methodist Episcopal Church, South, is located at Decatur, in DeKalb county, about eight miles from the city of Atlanta. It was founded in 1867. The plan was originated by Rev. Jesse Boring, M.D., and D.D. The home has no endowment and depends upon the voluntary contributions of the people. Yet it is well maintained, and additions are constantly being made to its equipment. The property consists of seven comfortable buildings, prettily situated, and a farm which raises produce for sale in the market after supplying the needs of the home. In addition to going to school the boys work on the farm, while the girls learn to sew, cook, wash and iron.

The Orphan Home of the South Georgia Conference of the Methodist Episcopal Church, South, is located in Vineville, a beautiful suburb of the city of Macon. It was organized June 12, 1873. It has a dairy and farm for the boys, and a cutting, fitting and making department for the girls, who also take their turn at cooking and general housework. The trustees intend adding other departments as they may be able. Of course all the children attend the school of the home. This institution was first founded as a private benevolent enterprise in 1857 by Mr. Maxwell of Macon. In 1873 it passed into the hands of the South Georgia Conference.

The Appleton Orphan Home at Macon is the property of the Protestant Episcopal Church, and was built through the liberality of Mr. Appleton of New York.

The Baptist Orphans' Home at Hapeville, eight miles from the city of Atlanta, is beautifully located in full view of the Central Railroad. There are three main buildings. The central one, known as the Administration Building, fronts the railroad. To the right with a front of 60

feet and a colonial piazza 40 feet in length, stands the Boys' Cottage, a brick building donated by Mr. F. S. Etheridge of Jackson, Georgia, in honor of his mother. On the opposite side of the lawn stands a similar cottage for the girls, costing the same money and modeled after the same plan, a gift of Judge James R. Brown of Canton, Georgia, in memory of his daughter, Sallie Rice Brown.

Besides attending school the girls are taught to cut and fit clothing, do mending and repairing, housework, washing and ironing; and the boys are taught to cultivate the fields, clean the premises, cut wood and make fires.

Within the past year \$500 worth of produce of the farm has been sold, this being the surplus left after supplying the wants of the orphanage.

The Hebrew Orphan Home is located in the city of Atlanta, under the auspices of the Hebrews of Georgia, and supported by their congregations in the State. The Abram's Home in Savannah, is one of their most noted benevolent institutions.

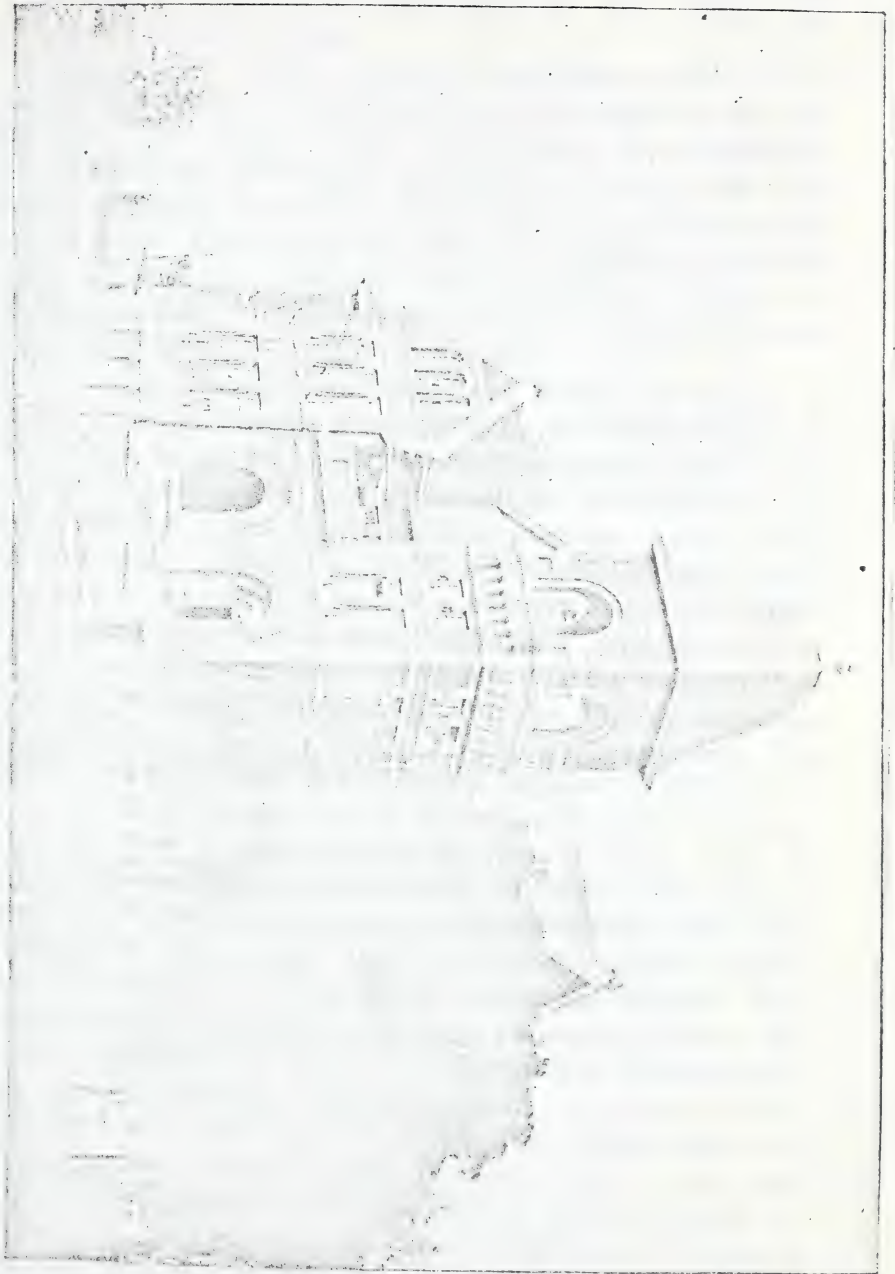
CHAPTER XV.

RELIGIOUS DENOMINATIONS OF GEORGIA.

When, on the 12th day of February, 1733, the first settlers under the lead of James Edward Oglethorpe landed at Yamacraw Bluff, they were accompanied by Dr. Henry Herbert, a clergyman of the Church of England. In March of the next year a body of Salzburger from Germany landed at Savannah. At Ebenezer in Effingham county, they built the first Lutheran Church in Georgia. Of this church the first pastor was the Rev. John Martin Bolzius. In 1786 there were three Lutheran churches in Georgia, one at Ebenezer, one at Goshen and one in Savannah.

Rev. Henry Herbert, pastor of the Episcopal Church at Savannah, was succeeded by Rev. Samuel Quincy, and he was followed by John Wesley in 1736, and George Whitefield in 1738. Charles Wesley accompanied his brother John to Georgia. The two Wesleys and Whitefield are renowned as the founders of the powerful and influential body of Christians known as Methodists, though neither one of them ever separated himself from the Church of England, in which the three were ordained ministers. When in 1755 the trustees surrendered their charter to the crown and Georgia became a royal province, the Church of England (Episcopal), was declared to be the established church of the colony. Parishes were formed, in three of which were churches; one in Savannah, one in Augusta and one in what is now Burke county. The three counties of Chatham, Richmond and Burke were at that time known as Christ Church Parish, St. Paul's Parish and St. George's Parish. Part of what is now Chatham county was known as St. Philip's Parish. Outside of Savannah, the churches were supplied with missionaries sent out by the "Society for the Propagation of the Gospel in Foreign Parts." The Revolution caused a temporary abandonment of the field by the Church of England and, as far as can be ascertained, there was no organized Episcopal Church in Georgia for nearly twenty years after the establishment of independence. The first bishop of this church who visited Georgia was Bishop Dehon of South Carolina, who came in 1815, to consecrate the new building for Christ Church, where he confirmed a class of sixty. This was the first confirmation ever held in Georgia. In 1840 the Rev. Stephen Elliott was elected the first bishop of the diocese, which

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office he held until his death in 1866. He was succeeded by Rev. John W. Beekwith in 1867, upon whose death the Rev. Cleland Kinloch Nelson was elected bishop.

As early as 1735 a colony of Scotch Presbyterians settled at New Inverness, now Darien, in McIntosh county, at the mouth of the Altamaha river. Their pastor was Rev. John McLeod. The Independent Presbyterian Church of Savannah was organized about the year 1765. The first presbytery was held at Liberty Church in Wilkes county, March 16, 1797. The names of the ministers constituting it were John Newton, John Springer, Robert M. Cunningham, Moses Waddell and William Montgomery. The Synod of Georgia now embraces five presbyteries, extending over all sections of the State.

It has already been mentioned that John Wesley, the founder of Methodism came to Georgia, accompanied by his brother Charles in 1736, and that he was followed by George Whitefield in 1738. This may properly be regarded as the introduction of Methodism into America, although it was many years later when the church of that name was formally established on the Western Continent. Mr. Wesley used to refer to the coming of himself and brother and of Mr. Whitefield to America as the "second rise of Methodism." Georgia in her infancy had the ministry of John and Charles Wesley, Benjamin Ingham, George Whitefield, Delamotte and Cornelius Winter, men whose names are familiar in the early history of the Methodist movement. The Methodist Episcopal Church of America was organized in Baltimore in 1784 on account of the separation of the colonies from Great Britain. Mr. Wesley, acting in accordance with his views of church polity, ordained Dr. Thomas Coke as superintendent. He came to America and set apart Rev. Francis Asbury as superintendent or bishop of the Methodist societies in this country. In 1785 Methodist ministers entered Georgia at Augusta, coming from North Carolina and Virginia. Soon afterwards Georgia was included in the South Carolina Conference. The first circuit extended from the city of Savannah to Wilkes county. Among the most prominent pioneer preachers were James Foster, Thomas Humphries, John Major, Hope Hull, John Garvin, Stith Mead and Levi Garretson. As early as 1805 Dr. Lovick Pierce was an active itinerant Methodist preacher in Georgia. His son George F. Pierce, one of the most renowned pulpit orators of the world, became a bishop in the Methodist Church. In 1830 the Georgia Conference was formed. In 1840 the Methodist Episcopal Church in the United States divided into two general conferences. The church in the Southern States has since that time been known as the Methodist Episcopal Church, South.

By 1866 the Georgia Conference had become too large and was divided into the North and South Georgia Conferences.

The first Baptist in Georgia, of whom there is any account, was Nicholas Begewood, in 1757. This gentleman was an agent of Whitefield's Orphan House near Savannah. As far as has been ascertained, the first Baptist Church organized in Georgia was in 1772, at Kiokee Meeting-House, where Appling, in Columbia county, now stands, under the ministry of Rev. Daniel Marshall, at that time the only ordained Baptist minister in Georgia. In the year 1794 Messrs. Jonathan Clarke, George Mosse, Thomas Polhill and David Adams proposed the erection of a house of worship for the Baptists of Savannah, who at that time numbered not more than eight or ten. They were encouraged to take this step by Rev. Mr. Reese, a Baptist minister from Wales, who visited Savannah. Accordingly by the help of their Christian brethren of other denominations a Baptist Church was erected in 1795, under the superintendence of Ebenezer Hills, John Millen, Thomas Polhill, John Hamilton, Thomas Harrison and John R. Roberds, as trustees.

In 1796, as they had no pastor, they rented their church to the Presbyterians whose house of worship had been destroyed by fire. The Presbyterians occupied it for three years, when the Rev. Henry Holcombe became the pastor of the Baptist Church of Savannah. Under his ministry the membership was greatly increased. The Georgia Baptist Convention was organized in 1822 at Powelton, Hancock county. Rev. Jesse Mercer was Moderator of the first meeting of the convention. Other prominent ministers of this denomination of the early period were Edmund Bottsford and Silas Mercer.

There is another denomination whose members, like the Baptists, hold to immersion as the only method of Christian baptism, but who refuse to be called by any other name than that of Christians or Disciples. One of their founders was the pious and learned Alexander Campbell of Kentucky.

The Congregationalists, though few in numbers, are zealous and enterprising.

The Unitarians are not yet very strong in Georgia; neither are the Universalists.

The first Roman Catholic church established in Georgia was at Locust Grove in Taliaferro county, seven miles from Crawfordville, by a colony of Catholics from Maryland in 1794. Soon afterwards a number of Catholics who were refugees from the terrible massacres of St. Domingo, settled in Savannah and Augusta, and a priest, who came with them, went to Locust Grove. He was, as far as the record goes, the first Roman

Catholic clergyman that ever officiated as pastor of a church in Georgia. This State and the two Carolinas were subject to the See of Baltimore until July 11, 1820. At that time these three States were raised to a diocese by the appointment of Dr. John England, who was the first Catholic bishop of Charleston. There was at that time but one Roman Catholic Church with regular services in Georgia. That one was in Augusta—those at Locust Grove and Savannah being without pastors. Georgia was made a distinct diocese November 10, 1850, and Rev. Dr. Gartland was appointed the first bishop with residence at Savannah. He was succeeded after his death by Bishops Barry, Verot and Persico. On April 27, 1873, Rev. William H. Gross was appointed bishop.

The following statistical table of the leading Christian denominations in Georgia for the year 1900 will prove interesting and instructive:

BAPTIST CHURCH IN GEORGIA

	Church Buildings	Value	Ordained Preachers	Number of Members	Sunday Schools	Number of Pupils	Value of all Church Property.
White Baptists	2,086	.....	1,322	193,236	712	41,052	Over \$3,000,000
Colored Baptists	1,500	.....	1,000	175,000	500	35,000	About 900,000
Total	3,586	.....	2,322	368,236	1,212	76,052	\$3,900,000

METHODISTS IN GEORGIA

Methodist Episcopal Church, South.	Ordained Preachers			Number of Members	Church Buildings	Value	Parsonages	Value	Value of all other Church Property	Sunday-schools	Pupils
	Itinerant	Local	Total								
North Georgia Conference	276	299	575	90,009	771	\$1,091,780	176	\$223,435	\$667,424	740	50,934
South Georgia Conference	199	224	423	62,638	617	\$855,982	121	\$159,800	\$78,416	561	30,829
Total	475	523	998	161,647	1,388	\$1,977,462	297	\$383,235	\$745,870	1,301	80,863
Methodist Episcopal Church (called in Georgia Northern Methodist)	29	41	70	3,460	77	\$2,107	10	\$4,000	.....	56	3,813
Colored M. E. Church of America (set off from the M. E. Church, South):											
North Georgia Conference	97	188	285	9,902	291	.....	12	.....	.....	.....	5,677
South Georgia Conference	197	295	492	14,450	501	.....	30	.....	.....	.....	7,410
African M. E. Church.....	500	300	800	80,000	950	\$1,000,000	300	\$100,000	\$600,000	500	25,000
Protestant Methodists (re-United)	.....	.....	.....	3,000	.....	.....	.....	.....	.....	.....	.....
Total	125	1317	2442	241,968	3,205	\$3,029,569	619	\$487,225	\$1,315,870	1,857	117,898

PRESBYTERIAN CHURCH IN GEORGIA

	Ordained Ministers.	Number of Churches.	Total Communicants.	Sunday school Scholars.
White	110	211	16,138	10,316
Colored	23	26	1,892	2,253
Total	133	237	18,030	12,569

The Presbyterians have much valuable Church property; but the exact figures were not available. The money raised by Methodists, Baptists and Presbyterians for missions and for benevolent and educational purposes run up into the millions.

CONGREGATIONALIST CHURCH

	Ordained Ministers.	Number of Members.	Church Buildings.	Value.	Number of Parsonages.	Value.	All other Church Property.	Number of Sunday-Schools.	Number of Pupils.
White and Colored	68	4,714	65	\$ 100,000	7	\$ 6,500	\$ 465,000	66	4,284

PROTESTANT EPISCOPAL CHURCH IN THE DIOCESE OF GEORGIA

Ordained Preachers.	Number of Members.	Number of Church Buildings.	Number of Parsonages.	Number of Sunday-School Pupils.	Value of all Church Property.
Bishops ... 1					
Priests....47	White .....7,090	137	29	White .....3,437	\$756,679 87
Deacons... 6	Colored 886	....	..	Colored 968	.....
Total.....54	Total .....7,976	137	29	Total.....4,405	\$756,679 87

Capital invested for benevolent and educational objects, \$316,837.37.

CHRISTIAN CHURCH (OR DISCIPLES)

Number of Preachers.	Number of Members.	Church Buildings.	Number of Sunday-School Pupils.	Value of all Church Property.
75	9,805	110	3,147	\$146,200

ROMAN CATHOLIC CHURCH IN THE DIOCESE OF GEORGIA.

Secular Priests...15	Number of Members.	Church Edifices..... 26	Value.	Parsonages.	Value.	Sunday-Schools.	Pupils.
Priests of Religious Orders....25	20,000	Chapels.....14	\$500,000	18	\$ 9,000	10	2,500
Total.....40		Total.....40					

Three Orphan Homes, valued at \$20,000.

The Hebrews in Georgia constitute an enterprising law-abiding class of the population, and are found in all the cities and important towns. They number about 6,200, have handsome synagogues in all the large cities and several benevolent institutions in the State.



GOVERNOR ALLEN D. CANDLER.



CHAPTER XVI.

STATE GOVERNMENT.

The government of Georgia, like that of all the other States of the Union, is republican in form, and is divided into three departments, the Executive, the Legislative and the Judicial.

The executive, or administrative branch of the government, is placed in the hands of the Governor, Secretary of State, Comptroller-General, Treasurer, Attorney-General, Commissioner of Agriculture and State School Commissioner elected by the people, Principal Keeper of the Penitentiary, a Railroad Commission and a Pardon Board appointed by the Governor. The Governor is vested with the veto power.

The legislative department consists of a Senate and House of Representatives, the members of both houses being elected by a direct vote of the people. The State is divided into forty-four senatorial districts from each of which one senator is elected. The members of the House of Representatives are elected from the counties in proportion to population, the more populous counties having three representatives.

The Judicial department consists of the Supreme Court with three justices, the superior court, the court of ordinary, and the justice courts. In addition to these, city and county courts are created by special act, and vested with limited jurisdiction and powers.

The Supreme Court is the court of last resort and has no original jurisdiction. The superior court may be termed a court of general jurisdiction, though its jurisdiction does not extend to all cases. In certain cases it has also appellate jurisdiction. The court of ordinary is the probate court, with general powers relative to county matters. The justice courts have jurisdiction in civil cases arising out of contract and damage to personal property, provided the amount does not exceed \$100. In criminal cases it is a committing court. Under the conservation and safe administration of the State's affairs for many consecutive years, aided by wise enactments of the legislature, Georgia's finances have been brought out of the chaos in which war and reconstruction left them, and now her credit stands as high as that of any State in the Union.

The constitution of the State adopted in 1877 guards well the rights of the people and prevents extravagant appropriations by the legislature.

The laws enacted give proper protection to individual and corporate capital without any injustice to the laborer. There is no interference by the legislature with the right of contract, except where humanity demands it. In upholding and enforcing the law the courts and the governor have the moral support of the community. Never, except in the case of a most heinous, unmentionable crime, has the right of trial by jury been violated, and even then under the most exasperating circumstances no Georgia mob has even been guilty of the excesses perpetrated by the Illinois mobs in the spring of 1900, or the mob at Akron, Ohio, in August of the same year.

Although the power of taxation is vested in the legislature, the abuse of it is wisely guarded against by the State Constitution. No taxes can be levied by the legislature except for the support of the government and public institutions, the payment of principal and interest of the public debt, to suppress insurrections or repel invasion, to pension under certain restrictions Confederate soldiers and the widows of Confederate soldiers, and to provide a system of elementary education. The Constitution provides that taxation shall be uniform on all classes and *ad valorem* on property. For educational purposes a poll-tax of one dollar is provided.

Public property, colleges, schools, churches, cemeteries, literary associations and public libraries, paintings and statuary not for sale, are exempted from taxation.

County taxation is limited to public works, court expenses, prisons, the debt existing at the time of the adoption of the Constitution. A two-thirds vote is required to increase the debt of any county or municipality, and the amount of the debt must not exceed seven per cent. of the assessed value of property. Counties and municipalities are not allowed to become stockholders in any corporation, and are forbidden to lend or give except to charities and schools. All taxes must be collected under general laws. The property, real or personal, of citizens of the United States not residing in Georgia cannot be taxed higher than the property of residents.

No foreign corporation is allowed to own more than 5,000 acres of land without first becoming a corporation of the State under her laws.

Conveyances of real estate are made by deed, which must be signed by the maker, attested by at least two witnesses, delivered to the purchaser or some one for him, and founded on a valuable or good consideration. No special form is required. It is sufficient, if it states clearly the transaction between the parties. A deed executed out of the State, in order to be entitled to record, must be attested by a commissioner of deeds for

the State of Georgia, a counsel or vice-counsel of the United States, a judge of a court of record, with the certificate under seal of the clerk of the court to the genuineness of the signature of such judge. If the deed is executed in the State, it cannot be recorded, until attested by a judge of a court of record, or a justice of the peace, or a notary public, or a clerk of the superior court.

In the case of the last named officers, the deed must be attested in the county where they hold office. If not so attested at the time of its execution, it may be acknowledged before any of these officers and the fact certified on the deed. If it has not been so attested or acknowledged, it may become entitled to record upon the affidavit of a subscribing witness before either of the officers testifying to the execution and attestation of the deed. If the witnesses are dead or incapacitated, the affidavit of a third party to the execution or genuineness of the signature of the witness or witnesses will admit it to record. Deeds to evade the usury law, or a part of a usurious contract, are void.

The legal rate of interest in Georgia is seven per cent. though by special contract eight per cent. may be charged. Any rate above that is considered usury, the penalty for which is the forfeiture of the excess of interest.

By law certain liens are established.

1. State, counties, and municipal corporations for taxes.
2. Decrees and judgments of the courts.
3. Laborers' special lien on the products of their labor, and generally on the property of their employer.
4. Special liens of landlord for any necessities furnished to tenants for the purpose of making a crop or supporting their families, such lien being upon crops made during the year in which such supplies were furnished. They have also a general lien for rent.
5. Lien held by mechanics on property manufactured or repaired, for material furnished or work done.
6. Innkeepers, carriers, stable-keepers, pawnees, and depositaries have liens on special property in their possession.
7. Mechanics, contractors, material men, manufacturers, including corporations, have liens on railroads, factories, houses, etc., for material furnished or for work done.

The general rule is that liens must be enforced by suits within one year.

The statutes of limitations fix certain limits on the time in which actions must be brought, as follows: instruments under seal, twenty years; statutory rights, twenty years; promissory notes not under seal

and other simple contracts in writing, six years; contracts not in writing and open accounts, four years; foreign judgments, five years; domestic judgments, seven years without execution issued, with docketed seven years from the last entry on the execution. Dormant judgments may be revived by *scire facias* within three years from dormancy; suits against administrators, guardians, executors or trustees, except on their bonds, ten years; suits to recover trust property, three years after the removal of the disability; trespasses or damages to realty or personalty, four years; personal injuries, two years; injuries to reputation, *qui tam* actions of informers, and claims against a county, one year; against discharged administrator by the heirs or distributees, five years.

The extreme penalty of the law for murder is death or imprisonment for life. For capital offenses other than murder the limit of imprisonment is seven years; for all other felonies, four years; for misdemeanors, two years.

All promises to answer in any way for the debts of others, in order to be binding, must be in writing, signed by the party to be bound, or his authorized agent.

The homestead laws differ materially from those of most States, being somewhat in the nature of a trust estate in charge of the court for the benefit of dependents, which becomes subject to debts when the conditions and purposes for which it was created cease to exist.

Due precaution is taken to prevent fraud on the part of debtors in disposing of and conceding their property. While statutory proceedings in attachment and garnishment are allowed upon the usual grounds, the wages of daily, weekly and monthly laborers are excepted from garnishment.

The rights of creditors are favored by the courts and every facility for the collection of debts has been made.

In the making of a will no particular form is required. All wills, except nuncupative, must be in writing, signed by the maker, or in his presence and by his direction. Every will must be attested by three competent witnesses in the presence of the testator. All wills disposing of real property in the State, in order to be entitled to probate, must be executed with the same formality as if made in the State. Bequests to any kind of institutions must be executed at least ninety days before the death of the testator, and must not so dispose of more than a third of the estate, if the testator has a wife, child, or descendants. If any bequest violates this rule, it is null and void.

The legal age at which marriage may be contracted is seventeen in males and fourteen in females. Under eighteen in females the consent

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DR. THOS. P. JAMES,
First Commissioner of Agriculture.



of the parents must be obtained. Marriage within the Levitical degrees of affinity and consanguinity are forbidden.

Miscegenation, or marriage between the white and colored races, is forbidden.

The divorce laws are better than those of many States, in that they make the sundering of the marriage tie no easy matter.

The property rights of the wife, both real and personal, are fully protected by the law.

Banking, insurance, railroad, canal, navigation, express, and telegraph companies, formerly chartered by the General Assembly are now chartered by the Secretary of State upon petition, and are given by statute the powers usually conferred upon such companies. Other corporations are chartered by the superior court in the county where their principal office is located.

The Comptroller-General is *ex officio* Insurance Commissioner, and a license from him, granted only upon certain conditions, is required of all companies, and to him statements of the assets and liabilities of the companies must be made. No security is required of purely mutual life companies. Fire insurance companies are required to make a deposit of \$25,000 in cash or approved bonds, and life insurance (stock) companies must make a deposit of \$100,000.

The State Treasurer is by law the State Bank Examiner, and is required to examine each bank at least once a year, and to him is made a quarterly statement which is required to be published. The general banking laws of Georgia furnish the depositors excellent protection against fraudulent loss. One of these laws forbids their lending to their officers without good collateral, and except on collateral no more than ten per cent. of their capital can be loaned to any one person. Cash assets must not be reduced below 25 per cent. of the deposits. Every precaution is taken against any possibility of fraud.

Pure food laws protect the people of the State against adulterated and unwholesome foods of any kind.

The propagation of fish is confided to the Commissioner of Agriculture, who is authorized to employ a superintendent of fisheries, who, under the direction of the commissioners, shall have charge of the propagation of fish.

In all the rivers of Georgia, in which shad are caught, there is a "closed time" of forty-eight hours each week, from sunrise on Saturday to sunrise on the following Monday, during which no shad or other migratory fish are allowed to be caught by any means whatever. No shad are allowed to be taken by any means whatever except between the

first day of January and the twentieth day of April of each year, except for spawning purposes.

The game laws protect birds and all othe game against hunters during certain specified seasons.

The Commissioner of Agriculture is charged with the execution of the quarantine laws for the protection of cattle against Texas fever and the cattle tick. For a thorough understanding of this subject we publish the bulletin on Cattle Quarantine Laws, published by the Department of Agriculture.

AUTHORITY FOR MAKING RULES AND REGULATIONS.

AN ACT.

To protect the cattle of this State from all contagious or infectious diseases, to authorize and empower the Commissioner of Agriculture of this State to establish, maintain and enforce quarantine lines, and make such rules and regulation as he may deem proper and necessary for the purpose of carrying into effect the provisions of this Act, to prohibit the driving of diseased cattle through said State, or cattle calculated to spread disease, to provide a penalty for violation of same, and for other purposes.

COMMISSIONER OF AGRICULTURE'S DUTY.

Section 1. Be it enacted by the General Assembly of the State of Georgia, and it is hereby enacted by authority of same, That the Commissioner of Agriculture of this State shall immediately upon the passage of this Act, and from time to time thereafter, ascertain in what sections of this State cattle are free from contagious or infectious diseases and splenetic fever.

QUARANTINE FOR CATTLE.

Sec. 2. Be it further enacted by the authority aforesaid, That wherever the cattle of any section of this State are found to be free from contagious and infectious diseases and splenetic fever, said Commissioner of Agriculture is hereby authorized, empowered and required to establish and maintain such quarantine lines, and to make and enforce such rules and regulations as may be necessary for the protection of such cattle.

CO-OPERATION WITH OTHER STATES.

Sec. 3. Be it further enacted by the authority aforesaid, That the said Commissioner shall co-operate with the officials of other States, and with the Secretary of Agriculture of the United States in establishing such

quarantine lines, rules and regulations as he shall deem proper and best for the protection of the cattle of this State free from any of the diseases referred to in the foregoing sections of this Act.

PENALTY.

Sec. 4. Be it further enacted by the authority aforesaid, That any person or persons, company or corporation who shall violate any quarantine provisions, rules or regulations established by the Commissioner of Agriculture of this State, under the authority conferred by this Act, shall be guilty of, and, upon conviction, punished as for a misdemeanor.

Sec. 5. Be it further enacted, That all laws and parts of laws in conflict with this Act be, and the same are, hereby repealed.

Approved December 20, 1899.

PROCLAMATION OF THE RULES AND REGULATIONS FOR THE CONTROL OF CONTAGIOUS OR INFECTIOUS DISEASES OF CATTLE.

To Whom it May Concern:

In accordance with the authority and power conferred by the General Assembly of Georgia in the Act No. 374, laws of 1899, entitled, "An Act to protect the cattle of the State from all contagious or infectious diseases, to authorize and empower the Commissioner of Agriculture of this State to establish, maintain and enforce quarantine lines, and make such rules and regulations as he may deem proper and necessary for the purpose of carrying out the provisions of this Act, to provide penalties for violation of the same, and for other purposes," I, O. B. Stevens, Commissioner of Agriculture of the State of Georgia, after due inquiry into the conditions of cattle-raising in this State and the prevalence of communicable cattle diseases, do hereby set forth and declare the following rules and regulations for the control of contagious or infectious diseases of cattle in the State of Georgia.

April 30, 1901.

(Signed)

O. B. STEVENS,
Commissioner of Agriculture.

RULES AND REGULATIONS.

The term cattle used in these regulations shall include bulls, oxen, steers, cows, heifers, yearlings and calves.

The terms "contagious" or "infectious diseases" shall include all diseases of cattle which are communicable from animal to animal; for example, contagious abortion, tuberculosis, (actinomycosis), anthrax, rabies, or splenic fever (including red water, bloody murrain, acclimation disease, Texas cattle fever, tick fever, and other local names).

Section 1. Whenever any contagious or infectious disease of cattle shall exist in any portion of this State, the infected cattle or infected material which may convey disease, or both, or animals which may have come in contact with such disease, shall be quarantined on the premises or in lots or buildings in which they may be found, until such time as danger from the spread of disease has passed, all necessary disinfection is completed, and they are released by order of the Commissioner of Agriculture.

Sec. 2. The annual regulations and amendments thereof of the United States Department of Agriculture concerning Interstate cattle transportation are hereby adopted as a portion of these regulations during such time as said regulations are in force.

Sec. 3. No cattle shall be transported, driven or caused to be driven, or allowed to stray from any place in the quarantine district in this State, into the districts exempted from the Federal quarantine by the United States Secretary of Agriculture between such dates as the Secretary and the Commissioner of Agriculture shall determine upon; Provided, that this order shall not apply to cattle transported by rail, consigned through such exempted districts to other States, which are transported in accordance with the Federal regulations relating to Interstate transportation of cattle.

Sec. 4. No cattle originating in the area of other States prescribed by the Secretary of Agriculture of the United States as having a contagious or infectious disease, known as splenic or Southern fever, among its cattle, shall be transported, driven or caused to be driven, or allowed to stray at any time of the year across or into any portion of this State in which cattle are declared by the said Secretary of Agriculture as being exempted in whole or in part from the operations of the Federal regulations concerning transportation of cattle originating in certain areas; Provided, this section shall not apply to interstate traffic in cattle by rail or by boat transacted in accordance with the Federal regulations relating thereto, or to uninfected cattle exempted by special permit of the United States Secretary of Agriculture; Provided further, that between such dates and under such regulations as may be agreed upon by the said Secretary of Agriculture and the Commissioner of Agriculture of this State, cattle may be transported, driven, or caused to be driven, or allowed to stray when found free of infection.

Sec. 5. When cattle from the infected areas, as defined by the Secretary of the United States Department of Agriculture in the annual regulations concerning cattle transportation and the amendments thereof, shall have moved or been moved in violation of these regulations or their amendments, the feeding places, yards, and pasturages upon which the said cattle have been moved shall become infected districts and subject to the same regulations as other infected areas; the limits of said infected area shall be defined by the extent of range allowed the animals from the infected areas and by the efficiency of the exclusion of other cattle from said infected districts.

Sec. 6. Notice is hereby given that cattle infested with the Boo-



HON. JOHN T. HENDERSON, SECOND COMMISSIONER OF
AGRICULTURE.

philus Bovis, or Southern cattle tick, disseminate the contagion of splenetic fever; therefore cattle which are found in the exempted districts infested with tick (*Boophilus Bovis*) shall be considered as infectious cattle.

Sec. 7. Such infectious cattle, or cattle suspected of being infectious, shall be kept in close quarantine and not admitted to the public road or free range until such time as they are disinfected or proven to be uninfected, and permission is granted by the Commissioner of Agriculture for their removal.

SPECIAL ORDER NO. 1.

Whereas, the cattle owners of Gilmer, Fannin, Union, Towns and Rabun counties have appealed to this Department for protection of their cattle from splenetic fever and cattle ticks, and it appears that the cattle of a greater portion of said counties are free from these pests, it is hereby ordered:

Section 1. That no cattle shall be driven into the counties of Gilmer, Fannin, Union, Towns and Rabun from any part of this State in which the cattle are declared infected with splenetic fever infection by the United States Secretary of Agriculture, or from any other State or portion thereof in which the cattle are declared infected until such cattle are exempted from the quarantine regulations by the said Secretary of Agriculture.

Sec. 2. That all cattle within the aforesaid area which are infested with cattle ticks, or which are suspected of being infected with such ticks, shall be placed in close quarantine and not allowed on the public roads or at large until such a time as shall be proven that they are not so infested, and they shall be released by order of the Commissioner of Agriculture.

The Commissioner will, upon application of the Ordinary or cattle owners of any county, temporarily forbid the entrance of cattle from any infected county or district until such time as danger of infection from said county or district is past. This local quarantine will be published in local newspapers and sufficient notices will be posted on the public roads.

Georgia Department of Agriculture.

Federal Cattle Quarantine Line.

Special Regulation No. 1.

Authorized by Georgia Laws of 1899, No. 374, "Protection of cattle against infectious diseases."

On and after this date no cattle (bulls, steers, oxen, cows, heifers, yearlings or calves) shall be led, driven, or caused to be driven, allowed to stray or carried in any manner into the counties of Gilmer, Fannin, Union, Towns and Rabun.

Violation of the above is a misdemeanor.

By order of

O. B. STEVENS,
Commissioner.

Atlanta, Ga., April 30, 1901.

DUTIES OF CATTLE INSPECTORS.

1. To see that the Rules and Regulations this day issued by the Commissioner of Agriculture of Georgia, found in another portion of this bulletin, be strictly enforced and carried out.

2. To locate all territory in your division or district of this State that may now or hereafter become infested with fever ticks. Take any legal steps necessary to prevent the ticks from spreading therefrom to any other territory in Georgia.

3. Place all infested cattle and pastures in quarantine, and report same, giving location of infested areas to the State Commissioner of Agriculture, Atlanta, Georgia.

4. Use all possible means to the end of exterminating the ticks on such infested farms or areas. Urge the cattlemen to grease them and care for their cattle, looking to the prevention of further propagation of the tick.

5. Advise the burning over, both in fall or spring, of all infested pastures or ranges with a view to the destruction of the cattle tick.

You will be held strictly to account for any trouble arising from the neglect of these instructions.

This April 30th, 1901.

Note.—Cattle inspectors receive salary from the State department, and cannot make any charges for inspecting cattle.

TEXAS FEVER AND CATTLE TICK.

No disease to which our cattle are susceptible has such an important bearing upon the cattle interests of the Southern States as "Southern Cattle Fever" or "Texas Fever." For this reason we have deemed it wise to issue from this department a short bulletin giving the salient points of the cause, history and present conditions, with a few common sense suggestions as to the prevention of this dread disease, known as the "Texas Fever." To a very large degree this disease prohibits the importation into our Southern country of pure bred animals from areas north of the United States' quarantine line of which we may be desirous for the building up of our dairy and beef cattle interests. Besides it has resulted in a barrier being placed by the Federal authorities known as the "Federal Quarantine Line" for the protection of Northern cattle against the exportation of our Southern stock to Northern markets, except these cattle be carried by rail or boat for immediate slaughter, which cripples to a great degree the Southern cattle industry on account of this cattle disease. It has been proved by experiment that when ticks which have been living on the blood of our Southern cattle are transported to latitudes north of the Federal Quarantine Line and become attached to cattle in those sections, or when Northern cattle from above the quarantine line are brought South and subjected to infection by ticks from our stock, the animals will contract this malady, which proves that the tick is the means through which the contagion is conveyed. Now, what we are most interested in, is how to

get rid of the tick, for when we destroy this pest we remove the source of this dreadful disease, which is called by many names, to wit: "Murrain, Bloody Murrain, Red Water, Yellow Water, Black Water, Acclimating Fever, etc., and according to the authorities all of these diseases are nothing more nor less than the Texas or Southern Cattle Fever. Nearly all authorities agree that this Bovine tick fever is a specific fever, communicated not in a direct manner from one animal to another, but indirectly through the medium of cattle from infected pastures, roads and other places, and in an indirect manner conveying the disease to susceptible animals which are exposed to those infected surroundings.

When it is known that beef cattle above the Federal Quarantine Line are worth from one to one and one-half cents per pound more than the same grade of cattle below the line, our people in Georgia can readily see the enormous profits they have lost for years past. By virtue of the fact that most of the counties of our State are tick infested they will see the importance of energetic, systematic and judicious work looking to the suppression of this dreaded pest named by Dr. Cooper Curtice the *Boophilus Bovis*.

WHEN AND WHERE THE TICK IS FOUND.

The cattle tick is found in warm weather in most of the States that lie south of the 35th parallel of latitude. During the heat of summer the Northern distribution is sometimes extended into Northern markets, but it is killed off in the fall or early winter months. In mild winters the tick may be found at any time of the year in South Georgia, but in some of the counties in extreme North Georgia the tick is practically exterminated by the frosts of winter and does not reappear until brought back in the course of cattle traffic. In severe winters this extermination extends further southward.

DIFFERENCE BETWEEN TICKS.

Dr. Cooper Curtice gives the following description of ticks:

"The fact that at least three species of ticks may be found on cattle and that one is disease bearing and outlawed, would seem to complicate matters. The existence of the other two species, however, enters very little into the problem practically, for they are easily told apart and are quite different in habits.

"All these ticks look alike, especially the large females, which are those usually seen. They are often as large as a castor oil bean seed, and usually leaden blue in color; have a soft, leathery body provided with four pairs of little legs and a hard little head with movable mouth parts. The three varieties can be distinguished by a glance at their heads. In the cattle tick the color is solid chestnut brown. In the variety that also pesters people, horses and dogs, the head has a little bright, often golden, spot at its back edge, from which it has gained the name 'lone star tick,' 'pass or spot tick.' The third variety, which

is often found on deer, dogs and other animals, has the head nearly white or with a white margin. It is commonly called 'deer tick,' 'dog tick' or 'bear tick.' These characters will always serve to distinguish the species. While the male, which is an inconspicuous little fellow, always accompanies the female, his presence is of no practical importance, since it is the female which attracts our attention and against which all efforts must be made. Their resemblance, especially in the head parts, to the females, and their association with females, enables the observer to readily classify them.

"The lone star tick and the dog tick usually attach themselves to animals when the latter are going through the woods or in marshy places, while the cattle tick rarely gets on man, or other animals save possibly horses, and is always found in pastures where cattle have spread them.

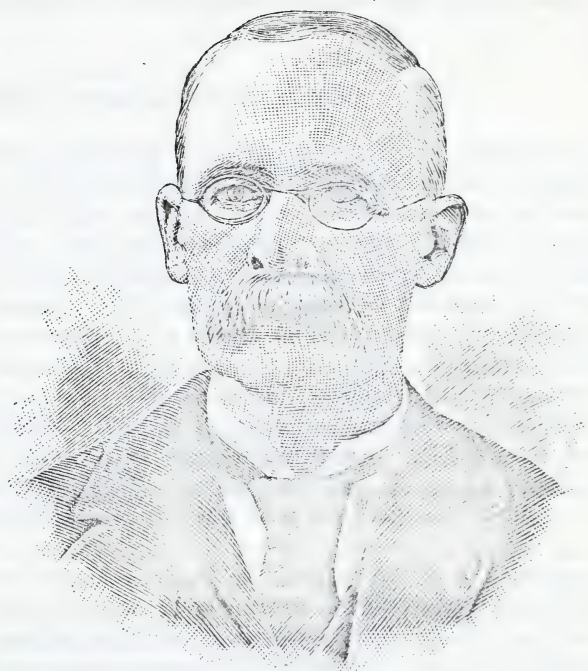
"The star tick and the dog tick usually get about the ears, dewlap and sides of cattle, while cattle ticks are most numerous on the lower edge of the dewlap, along the underparts and on the thighs of the cattle. This is because the little ticks are the most numerous where the cows rest and get on them from short grass.

"The lone star and the dog tick are most commonly found from June to August, and then seem to disappear. They are soon followed by 'seed ticks,' which get upon one walking through the pastures and sink their heads beneath the skin. Often at the same time the 'mid-dling' or 'yearling,' an intermediate size between the seed and adult tick, is encountered. These are but different stages of either of the above ticks. Cattle ticks are not numerous in the spring, but rapidly increase in numbers as the seasons wear, or until they are said to literally shingle the cows by their hosts. The same steps of growth occur as in the other species, but they rarely if ever get upon people and spend their whole existence upon the cattle. It thus happens that the careful investigator may find all the stages from the seed tick, which may be seen by very close examination, up to the unsightly adult female."

LIFE OF THE CATTLE TICK.

Most authorities agree that all cattle ticks come from eggs laid by other ticks, and can only reach maturity on cattle; that the tick drops from the cow and remains passive a few days, then begins to lay eggs, and in two weeks she has laid some two thousand eggs to be hatched out in from three to six weeks according to the temperature of the weather. These eggs are generally deposited under a bunch of grass, leaves or sticks, being sheltered from the direct rays of the sun. When hatched the young ticks, or "seed ticks," spread out short distances, and attach themselves to the nearest blade of grass or twig and collect at their tops, and there appear to merely exist in wait for their future host—the cow.

After arriving on the cattle they remain there from three to four weeks, when the females become mature, and fall from the cattle to the ground wherever the cattle happen to be when the tick becomes



HON. R. T. NESBITT,
Third Commissioner of Agriculture.

mature. Hence the places most frequented by the cattle in the pasturage are where you will find the most infection, yet any place may become infected provided the cattle pass over it and drop the tick at such a place.

In summing up the life history of the tick Dr. Cooper Curtice says:

1. Ticks are introduced on farms by cattle.
2. Seed ticks appear in from twenty-five days to six weeks.
3. Ticks grow to maturity in about four weeks after they attach to cattle.
4. Ticks when mature fall to the ground to give rise to new multitudes.

SOME REMEDIAL SUGGESTIONS.

If proper and judicious work be done, there is no good reason why the farms and counties of North Georgia should remain infected longer than twelve months. In point of fact many militia districts, as well as almost entire counties, are practically free of the disease-carrying tick. We would not advise the discrimination between ticks, as all ticks are noxious and loathsome. Early spring is perhaps the best time to begin work, for the destruction of a single tick in spring is often the means of preventing thousands from coming into life. A female tick which lays from two to twenty-five hundred eggs will likely produce one thousand pairs of ticks. One tick in spring or summer will be sufficient to stock a farm of ordinary size in one year. Fields used for growing crops must be considered as uninfected, since frequent plowing and turning over the soil destroys the tick to a large degree. Old fields may be disinfected by burning off the dry grass in early spring and during the fall; but we would advise that marshy places and corners and small plots of woods that cannot be burned off be fenced from the cattle, as they would furnish a sufficient number of ticks to reinfect the whole pasture. If a large area now used for pasturing cattle be divided by a fence and use only one-half of the pasture for cattle, not allowing cattle to trespass upon the other half of the pasture, this method would practically free the latter half of the pasture from ticks in twelve months. If, however, the pasture be small and conditions are not suited to the above method, then the cattle must be carefully and continuously picked during the spring and summer, using from time to time sulphur and lard, or any grease that is most convenient. If this hand-picking is continued daily a small farm can be cleaned of the ticks in a short while. Oils and grease, however, have their uses on farms, and aid materially in disinfection, and save labor in the hand-picking process. A little tar mixed with the grease is advisable. The cattle should be thoroughly rubbed from time to time with these ointments. But there can be no successful extermination of the tick unless the county at large co-operates in this matter, to the extent that the highways and market places and stock yards shall be kept free of infection. So, if cattle men generally will carefully comply with the rules and regula-

tions and adopt the above suggestions, they will find that the extermination of the tick is but an easy matter, requiring patience and perseverance, with only a small expense.

SOME OF THE SYMPTOMS OF THE DISEASE.

Dr. Curtice says that experiment and observations show that the majority of cases break out and die in from 10 to 21 days after infection. For the first few days there is no fever or any indication of the disease, but either on the fifth or sixth day a very high fever breaks out, which often renders the animal delirious or stupid; their heads droop, their ears lop, cud chewing is suspended, and other signs of ill health follow. They usually die towards the end of the first week of fever, although some last into the second week, while a small percentage survive. The urine of diseased animals is usually deeply stained and appears even dark or black red, resembling the color of coffee. The eyeballs and other mucous membranes show a yellow cast. If the animals survive the attack of fever they remain poor and recover very slowly. The virulence of this disease varies at different seasons of the year, and in different animals. All who may desire to study this question fully from a scientific point we would advise to write to Dr. D. A. Salmon, Chief of the Bureau of Animal Industry at Washington, D. C., for bulletins on Texas fever and cattle tick. If this little bulletin should create an interest in the study of this disease and the remedies therefor, and bring about co-operation of the people looking to the suppression of this disease, its object will have been accomplished. Get rid of the tick and you get rid of the disease.

ACKNOWLEDGMENTS.

Much of the data given in this paper is taken from a bulletin from the North Carolina Bureau of Agriculture by Dr. Cooper Curtice, who was at the time of issue State Veterinarian of North Carolina.

FERTILIZER LAWS.

To prevent fraud and imposition in the sale of fertilizers, all fertilizers and fertilizer material sold, or offered for sale in the State must be registered, inspected and analyzed. Each bag, barrel or package must have branded thereon, or attached thereto, the guaranteed analysis of the manufacturer and dealer. In the event it does not come up to the guarantee, failure of consideration can be plead. All complete fertilizers must contain 2 per cent. of ammonia, actual or potential, with a sum of not less than 8 per cent. of available phosphoric acid and potash. Other fertilizers must contain 10 per cent. of available plant food. Failure to come up to the standard of the State voids the sale.

For the convenience of both manufacturer and consumer, the law regulating the sale of Commercial Fertilizers, passed and approved October 9th, 1891, is given in full below:

AN ACT.

To amend and consolidate the laws governing the inspection, analysis and sale of commercial fertilizers, chemicals and cotton-seed meal in the State of Georgia and to repeal all other laws and parts of laws in conflict therewith, and for other purposes.

Section I. Be it enacted by the General Assembly of the State of Georgia, That all manufacturers of, or dealers in, commercial fertilizers or chemicals, or cotton-seed meal, to be used in manufacturing the same, who may desire to sell or offer for sale in the State of Georgia such fertilizers, chemicals or cotton-seed meal, shall first file with the Commissioner of Agriculture of the State of Georgia the name of each brand of fertilizers or chemicals which he or they may desire to sell in said State, either by themselves or their agents, together with the name of the manufacturer, the place where manufactured, and also the guaranteed analysis thereof, and if the same fertilizer is sold under different names, said fact shall be so stated, and the different brands that are identical shall be named.

Sec. II. Be it further enacted, That all fertilizers, or chemicals for manufacturing the same, and all cotton-seed meal offered for sale or distribution in this State, shall have branded upon, or attached to, each bag, barrel or package the guaranteed analysis thereof, showing the percentage of valuable elements or ingredients such fertilizers or chemicals contain, embracing the following determinations:

Moisture at 212 deg. Fah.....	per cent.
Insoluble phosphoric acid.....	per cent.
Available phosphoric acid.....	per cent.
Ammonia, actual and potential.....	per cent.
Potash (K ² O)	per cent.

The analysis so placed upon, or attached to, said fertilizer or chemical shall be a guarantee by the manufacturer, agent or person offering the same for sale that it contains substantially the ingredients indicated thereby, in the percentages name therein, and said guarantee shall be binding on said manufacturer, agent or dealer, and may be pleaded in any action or suit at law to show total or partial failure of consideration in the contract for the sale of said fertilizer, chemical or cotton-seed meal.

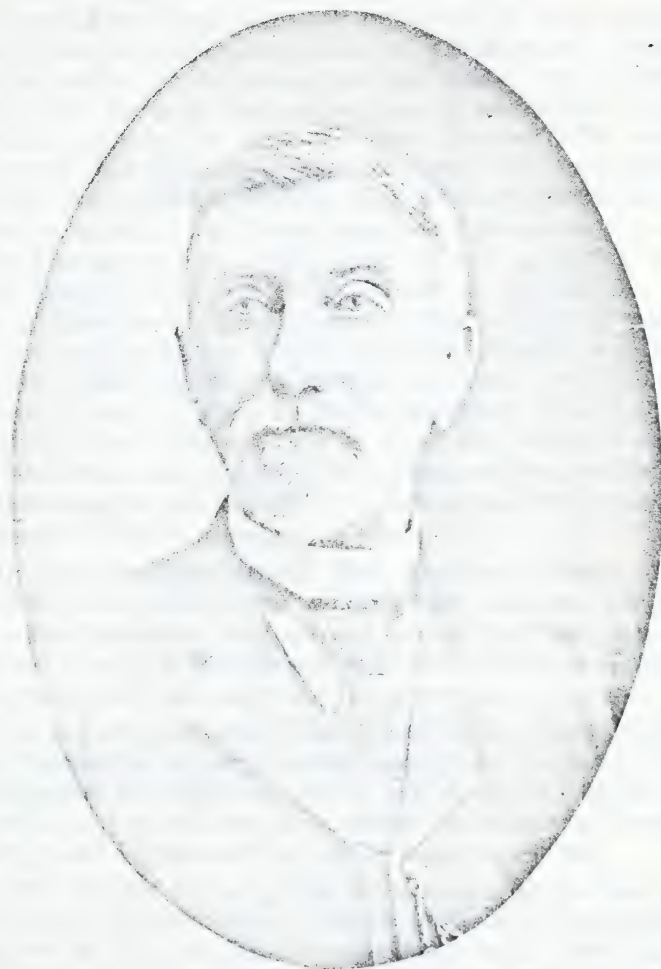
Sec. III. Be it further enacted, That it shall be the duty of the Commissioner of Agriculture to forbid the sale of either of the following: Any acid phosphate which contains less than ten per centum of available phosphoric acid; any acid phosphate with potash which contains a sum total of less than ten per centum of available phosphoric acid and potash when the per cents. of the two are added together; any acid phosphate with ammonia which contains a sum total of less than ten per centum of available phosphoric acid and ammonia when the per

cents. of the two are added together; any acid phosphate with ammonia and potash which contains a sum total of less than ten per centum of available phosphoric acid, ammonia and potash, when the per cents. of the three are added together; that no brands shall be sold as ammoniated superphosphates unless said brands contain 2 per cent. or more of ammonia. And also to forbid the sale of all cotton-seed meal which is shown by official analysis to contain less than 7 1-2 per cent. of ammonia. Nothing in this act shall be construed to nullify any of the requirements of an act entitled an act to require the inspection and analysis of cotton-seed meal.

Sec. IV. Be it further enacted, That all persons or firms who may desire or intend to sell fertilizers, chemicals or cotton-seed meal in this State, shall forward to the Commissioner of Agriculture a printed or a plainly written request for tags therefor, stating the name of the brand, the name of the manufacturer, the place where manufactured, the number of tons of each brand and the number of tags required, and the person or persons to whom the same is consigned, the guaranteed analysis, also the number of pounds contained in each bag, barrel or package in which said fertilizer, chemical or cotton-seed meal is put up, and shall at the time of said request for tags forward directly to the Commissioner of Agriculture the sum of ten cents per ton as an inspection fee; whereupon it shall be the duty of the Commissioner of Agriculture to issue tags to parties so applying, who shall attach a tag to each bag, barrel or package thereof, which, when attached to said bags, barrel or package, shall be *prima facie* evidence that the seller has complied with the requirements of this act. Any tags left in possession of the manufacturers or dealers at the end of the season shall not be used for another season, nor shall they be redeemable by the Department of Agriculture.

Sec. V. Be it further enacted, That it shall not be lawful for any person, firm or corporation, either by themselves or their agents, to sell or offer for sale in this State any fertilizer, chemical or cotton-seed meal without first registering the same with the Commissioner of Agriculture, as required by this act, and the fact that the purchaser waives the inspection and analysis thereof shall be no protection to said party so selling or offering the same for sale.

Sec. VI. Be it further enacted, That the Commissioner of Agriculture shall appoint twelve inspectors of fertilizers, or so many inspectors as in said Commissioner's judgment may be necessary, who shall hold their offices for such terms as said Commissioner of Agriculture shall in his judgment think best for carrying out the provisions of this act. The greatest compensation that any one inspector of fertilizers shall receive shall be at the rate of one hundred dollars per month and his actual expenses while in the discharge of his duty as such inspector. It shall be their duty to inspect all fertilizers, chemicals or cotton-seed meal that may be found at any point within the limits of this State and go to any point when so directed by the Commissioner of Agriculture, and shall see that all fertilizers, chemicals or cotton-seed meal are properly tagged.



HON. O. B. STEVENS COMMISSIONER OF AGRICULTURE.

Sec. VII. Be it further enacted, That each inspector of fertilizers shall be provided with bottles in which to place samples of fertilizers, chemicals or cotton seed meal drawn by him, and shall also be provided with leaden tags, numbered in duplicate from one upward; and it shall be the duty of each inspector of fertilizers to draw a sample of all fertilizers, chemicals and cotton-seed meal that he may be requested to inspect, or that he may find uninspected, and he shall fill two sample bottles with each brand, and place one leaden tag of same number in each sample bottle, and shall plainly write on a label on said bottles the number corresponding to the number on said leaden tags in said bottles, and shall also write on the label on one of said bottles the name of the fertilizer, chemical or cotton-seed meal inspected, the name of the manufacturer, the place where manufactured, the place where inspected, the date of inspection, and the name of the inspector, and shall send or cause to be sent to the Commissioner of Agriculture the sample so drawn by him annexed to a full report of said inspection, written on the form prescribed by said Commissioner of Agriculture, which report must be numbered to correspond with the number on said sample bottles and number on the leaden tags placed therein; and it shall also be the duty of said inspectors of fertilizers to keep a complete record of all inspections made by them on forms prescribed by said Commissioner of Agriculture. Before entering upon the discharge of their duties they shall take and subscribe, before some officer authorized to administer the same, an oath faithfully to discharge all the duties which may be required of them in pursuance of this act.

Sec. VIII. Be it further enacted, That the Commissioner of Agriculture shall have the authority to establish such rules and regulations in regard to the inspection, analysis and sale of fertilizers, chemicals and cotton-seed meal not inconsistent with the provisions of this act, as in his judgment will best carry out the requirements thereof.

Sec. IX. Be it further enacted, That it shall be the duty of the Commissioner of Agriculture to keep a correct account of all money received from the inspection of fertilizers, and to pay the same into the treasury, after paying out of said sum the expenses and salaries of inspectors, and for the tags and bottles used in making such inspections.

Sec. X. Be it further enacted, That all contracts for the sale of fertilizers or chemicals in the State of Georgia made in any other manner than as required by this act, shall be absolutely void; *provided*, that nothing in this act shall be construed to restrict or avoid sales of acid phosphate, kainit or other fertilizer material in bulk to each other by importers, manufacturers or manipulators who mix fertilizer material for sale, or as preventing the free and unrestricted shipment of these articles in bulk to manufacturers or manipulators who mix fertilizer material for sale.

Sec. XI. Be it further enacted, That any person selling or offering for sale any fertilizers or chemicals without first having complied with the provisions of this act, shall be guilty of a misdemeanor, and on con-

viction thereof shall be punished as prescribed in section 4310 of the Code of Georgia.

Sec. XII. Be it further enacted, That all laws and parts of laws in conflict with this act be, and the same are, hereby repealed.

FORMAL REQUEST FOR REGISTRATION.

To O. B. Stevens, Commissioner of Agriculture, Atlanta, Ga.:

You are hereby requested to register for sale and distribution in the State of Georgia.....manufactured by.....
at.....

THE FOLLOWING IS THE GUARANTEED ANALYSIS OF THE BRAND.

Moisture at 212 deg. Fah.....	per cent.
Insoluble phosphoric acid.....	per cent.
Available phosphoric acid.....	per cent.
Ammonia, actual and potential.....	per cent.
Potash (K^2O)	per cent.
The ammonia is in the form of.....	

Nitrate of soda has.....been used in the manufacture of this brand.

The.....is put up in.....of
..... lbs. each
It is identical with.....

In consideration of being allowed to sell and distribute the above brand before the official analysis thereof is made.....agree and bind..... to cancel all sales thereof and forfeit all claims for purchase money therefor, if, after the official analysis is made, the Commissioner of Agriculture shall prohibit its sale in accordance with the law.

.....

2. Under section 4, relating to requests for tags, in order that no delay may occur in shipments, the manufacturer or dealer need not notify the Department at the time of the request for tags of the name of the purchaser or consignee, but must notify the Commissioner in writing of every sale or consignment on the day in which the same is made. This notice must distinctly state the brand of the fertilizer or the name of the chemical or fertilizer material and the number of tons, together with the name of the purchaser or consignee and their places of residence. It must request inspection and contain an agreement to cancel all sales thereof, in the event the Commissioner shall prohibit its sale in accordance with law. The following form may be used, substantial compliance with the above rule being regarded as sufficient:

NOTICE OF SALES AND CONSIGNMENTS, AND REQUEST FOR
INSPECTION.

.....190

To O. B. Stevens, Commissioner of Agriculture, Atlanta, Ga.:

You are hereby notified that.....have this day made the following sales and consignments, and request that the same be inspected:

In consideration of being allowed to sell and distribute the above before the official analysis thereof is made.....agree and bind.....to cancel all sales thereof and forfeit all claims for purchase money thereof, if, after the official analysis is made, the Commissioner of Agriculture shall prohibit its sale in accordance with law.

Manufacturers and dealers, by this rule, are not required to delay shipment in order that the inspection may be made, but are required to see that their goods are properly tagged, the inspection being made while the fertilizer or fertilizer material is in the hands of the purchaser or consignee.

3. All orders for tags must be sent direct to this department, and the request must be accompanied with the fees for inspection at the rate of ten cents per ton for the fertilizer or fertilizer material on which they are to be used.

Manufacturers and dealers, or their agents, may request tags in such quantities as they see fit, but each request must state distinctly the brand or brands on which they are to be used, with the number of tons of the brands, or of each of said brands.

It is not necessary that the fertilizer or fertilizer material be actually on hand at the time the request is made, but manufacturers or dealers can order such number of tags as they may need during the season, bearing in mind that no tags carried over will be redeemed by the department.

In the event that more tags are ordered for any brand than it is ascertained can be used on the sales and consignments of that brand, by proper notice, with the consent of the Commissioner, the tags can be used on another brand put up in packages or sacks of the same weight and sold or consigned the same season.

4. If a fertilizer be offered for registration, inspection or sale branded as either of the following:

"Ammoniated Superphosphate,"

"Ammonia Dissolved Bone,"

"Ammoniated Guano,"

"Guano,"

"Fertilizer."

or other words implying that the same is an ammoniated superphosphate

the guaranteed analysis must claim that it contains not less than two per cent. of ammonia (actual or potential).

5. That part of section 3 excepting from the operations of the act an act to require the inspection and analysis of cotton-seed "meal" leaves the inspection of that article under the Calvin bill, which requires that all cotton-seed meal, for whatever purpose to be used, be inspected. It is therefore necessary, and is required, that a request for inspection be sent to the Commissioner, and that the inspection be made in the hands of the manufacturer, dealer or their agent, or, if shipped in the State, at some convenient point, before the meal is sold or distributed. In all cases fees will be sent direct to the Commissioner, who will immediately order the nearest inspector to make the inspection.

CALVIN BILL.

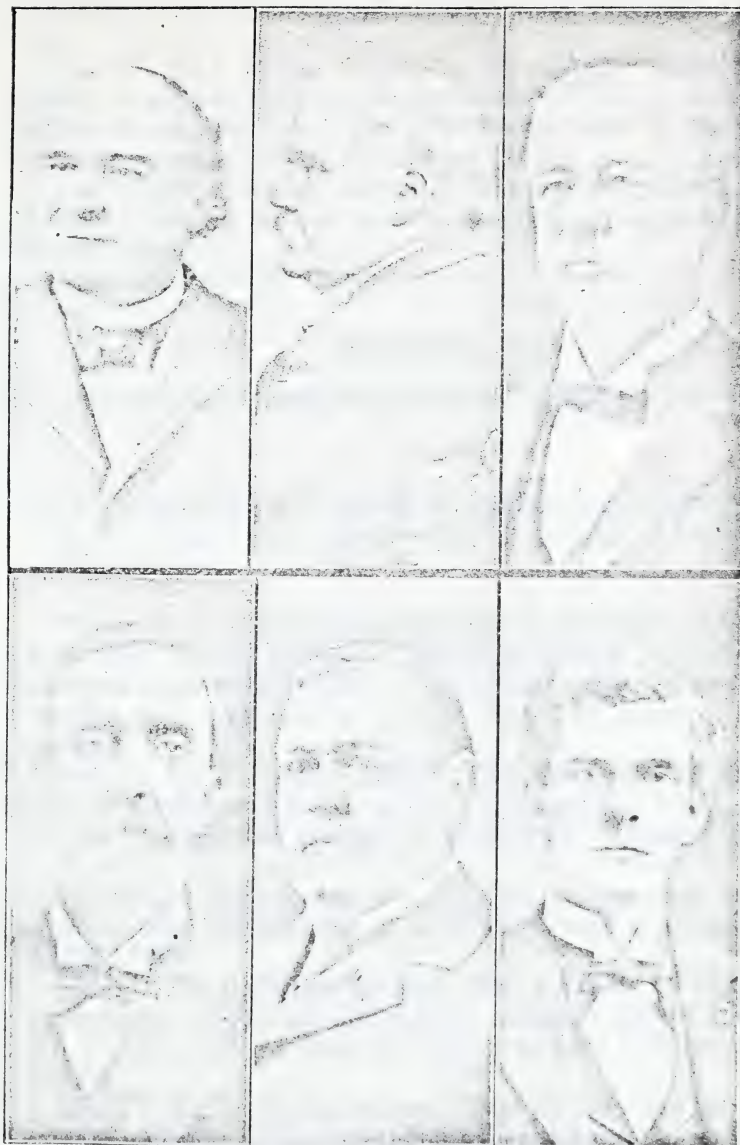
COTTON SEED MEAL.

A bill to be entitled an act to require all cotton-seed meal to be subjected to analysis and inspection as a condition precedent to being offered for sale, and to forbid the sale in this State of such cotton-seed meal if it be shown by the official analysis that the same contains less than 7 1-2 per centum of ammonia; to prescribe a penalty for the violation of the provisions of this act, and for other purposes.

Section I. Be it enacted by the General Assembly of Georgia, and it is hereby enacted by the authority of the same, That from and after the passage of this act it shall not be lawful for any person or persons to offer for sale in this State any cotton-seed meal until the same shall have been duly analyzed by the State Chemist and inspected as now required by law in the matter of all fertilizers and chemicals for manufacturing or composting purposes; nor shall it be lawful to offer such cotton-seed meal for sale in this State if it be shown by the official analysis that the same contains less than 7 1-2 per centum of ammonia; *provided*, that the provisions of this act as to the per centum mentioned in this section shall not apply to meal manufactured from sea-island cotton-seed; but the Commissioner of Agriculture shall, upon the passage of this act, fix and make public a minimum per centum, which shall control as to the cotton seed meal referred to in this proviso; *provided further*, that if any cotton-seed meal shall not analyze up to the required per centum of ammonia, the same may be offered for sale as second-class meal, provided the analysis be made known to the purchaser and stamped on the sack.

Sec. II. Be it further enacted by the authority aforesaid, That there shall be branded upon or attached to each sack, barrel or package of cotton-seed meal offered for sale in this State the true analysis as determined by the State Chemist, and the number of pounds net in each sack, barrel or package.

Sec. III. Be it further enacted by the authority aforesaid, That it



JUSTICES OF THE SUPREME COURT.

1. T. J. SIMMONS, Chief Justice.
2. SAMUEL LUMPKIN, Associate Justice.
3. W. A. LITTLE, " "
4. WM. H. FISH, " "
5. ANDREW J. COBB, " "
6. H. T. LEWIS, " "

shall be the duty of the Commissioner of Agriculture to take all steps necessary to make effective the provisions of sections 1 and 2 of this act.

Sec. IV. Be it further enacted by the authority aforesaid, That any person or persons violating the provisions of this act shall be deemed guilty of a misdemeanor, and on conviction shall be punished as prescribed in section 4310 of the Code of 1882.

Sec. V. Be it further enacted by the authority aforesaid, That all laws and parts of laws in conflict with this act be, and the same are, hereby repealed.

Approved July 22, 1891.

BLALOCK BILL.

COMMERCIAL FERTILIZERS—HOW BRANDED AND GRADED.

No. 358.

An act to prescribe three grades of complete commercial fertilizers, for the branding of same upon each sack or package of fertilizers, and for other purposes.

Section I. Be it enacted by the General Assembly of Georgia, That from and after the passage of this act it shall be unlawful to sell any complete commercial fertilizer in this State unless the grade of same is branded upon each sack or package thereof in letters of not less than one inch.

Sec. II. Be it further enacted, That the grades of such fertilizer shall be divided into three, to wit: "High grade," which shall contain not less than fourteen per cent. of plant food; "Standard grade," which shall contain not less than twelve per cent. of plant food, and "Low grade," which shall contain not less than ten per cent. of plant food; *provided*, this act shall not go into effect until after the first day of August, 1898.

Sec. III. Be it further enacted, That a failure to comply with the requirements of this act shall subject the seller thereof to all the pains and penalties now of force for failure to have fertilizers properly inspected.

Sec. IV. Be it further enacted, That all laws and parts of laws in conflict with this act be, and the same are, hereby repealed.

Approved December 21, 1897.

COMMERCIAL FERTILIZERS, HOW BRANDED, ETC.

No. 170.

An act to amend section 1 of an act entitled "an act to prescribe three grades of complete commercial fertilizers, for the branding of the same upon each sack or package of fertilizers, and for other pur-

poses"; so as to make it unlawful to sell any commercial fertilizers in this State unless the grade of same is branded upon each sack or package thereof in letters not less than one inch.

Section I. Be it enacted by the General Assembly of Georgia, That from and after the passage of this act, the above recited section be, and the same is, hereby amended by striking from the third line of said section the word "complete," so that when amended, said section shall read as follows: Be it enacted by the General Assembly of Georgia, That from and after the passage of this act, it shall be unlawful to sell any commercial fertilizers in this State unless the grade of same is branded upon each sack or package thereof in letters not less than one inch; *provided*, that this act shall not be construed as applying to cotton seed meal and German kainit and muriate of potash; and that said act shall not go into effect until the first day of August, 1899.

Sec. II. Be it further enacted, That all laws and parts of laws in conflict with this act be, and the same are, hereby repealed.

Approved December 22, 1898.

ELLINGTON BILL.

No. 168.

An act to regulate the sale of fertilizers in this State; to fix a method for determining the value of the same, and for other purposes.

Section I. Be it enacted by the General Assembly of Georgia, and it is hereby enacted by authority of the same, That from and after the passage of this act it shall be lawful for any purchaser of fertilizer from any owner thereof, or agent of such owner, to require of the person selling, and at the time of sale or delivery, to take from each lot of each brand sold a sample of its contents.

Sec. II. Be it further enacted, That said sample so taken shall be mixed together and placed in a bottle, jar or such other receptacle as the purchaser may present. It shall then be the duty of such purchaser and seller to deliver said package to the Ordinary of the county, who shall label same with the names of the parties and of the fertilizers.

Sec. III. Be it further enacted, That said Ordinary shall safely keep said package, allowing neither party access to the same, save as hereinafter provided. The Ordinary shall receive a fee of ten (10) cents from the party depositing such sample for each sample so deposited.

Sec. IV. Be it further enacted, That should said purchaser, after having used such fertilizers upon his crops, have reason to believe from the yields thereof that said fertilizer was totally or partially worthless, he shall notify the seller and apply to the Ordinary to forward the said sample deposited with him (or a sufficiency thereof to insure a fair analysis) to the State Chemist, without stating the names of the parties, the name of the fertilizer or giving its guaranteed analysis, the cost of sending being prepaid by the purchaser.

Sec. V. Be it further enacted, That it shall be the duty of said State Chemist to analyze and send a copy of the result to said Ordinary.

Sec. VI. Be it further enacted, That should said analysis show that said fertilizer comes up to the guaranteed analysis upon which it is sold, then the statement so sent by the State Chemist shall be conclusive evidence against a plea of partial or total failure of consideration. But should said analysis show that such fertilizer does not come up to the guaranteed analysis, then the sale shall be illegal, null and void, and when suit is brought, upon any evidence of indebtedness given for such fertilizer, the statement of such State Chemist, so transmitted to the Ordinary, shall be conclusive evidence of the facts, whether such evidence of indebtedness is held by an innocent third party or not.

Sec. VII. Be it further enacted, That in lieu of the State Chemist, should the parties to the contract agree upon some other chemist to make said analysis, all the provisions of the act shall apply to his analysis and report to the Ordinary.

Sec. VIII. Be it further enacted, That should the seller refuse to take said sample when so requested by the purchaser, then upon proof of this fact the purchaser shall be entitled to his plea of failure of consideration and to support the same by proof of the want of effect and benefit of said fertilizer upon his crops, which proof shall be sufficient to authorize the jury to sustain defendant's plea within whole or in part, whether said suit is brought by an innocent holder or not.

Sec. IX. Be it further enacted, That all laws and parts of laws in conflict with this act be, and the same are, hereby repealed.

Approved December 27, 1890.

ILLUMINATING OILS.

All illuminating oils must be inspected by an officer appointed for that purpose, and the Department of Agriculture is charged with the supervision and enforcement of the inspection laws concerning fertilizers and oils.

The following is the new Georgia oil law of 1899:

NEW GEORGIA OIL LAW.

AN ACT.

To prescribe the method of testing illuminating oils in this State, and the manner in which test shall be made, and to provide for the appointment of a General Inspector to aid in the inspection of such oils, and for other purposes.

Section 1. Be it enacted by the General Assembly of Georgia, and it is hereby enacted by authority of the same, That from and after the passage of this act it shall be the duty of the Commissioner of Agriculture of the State of Georgia to appoint a General Inspector of Oils of

said State, whose duty it shall be to go from point to point about the State at the direction of the Commissioner of Agriculture to inspect such oils as may be desired, instruct the local inspectors in the art of taking fair, correct and impartial samples of oils for illuminating purposes, and to test the same under provisions of this act; to check up all accounts and books of account of local oil inspectors, and to see that said moneys due the State from fees paid for oil inspections are paid into the State treasury, and to see that said local oil inspectors fairly, correctly and impartially discharge the duties imposed upon them by this act, and existing laws not in conflict herewith, and perform such other duties as may be prescribed by the Commissioner of Agriculture. If any dispute arises as to the test of any oils, then said General Inspector shall take a fair sample of said oil and forward it to the State Chemist, who shall make a final test and his decision shall control in all matters of dispute. Said General Inspector shall be paid a salary not to exceed (\$100.00) one hundred dollars per month and actual and necessary traveling expenses while in discharge of his duties, and said salary and traveling expenses shall be paid out of the fees collected from oil, inspections; provided, however, that this act shall not be in conflict with sections 1579-1584 and other sections of the Code of Georgia providing for the appointment and compensation of local oil inspectors.

Sec. 2. Be it further enacted by the authority aforesaid, That no person shall manufacture, or have in his possession, or sell, or give away for illuminating or heating purposes, in lamp or stoves within the State, any oil or burning fluid wholly or partly composed of naphtha, coal oil, petroleum or products thereof, or of other substances or material emitting an inflammable vapor, which will flash at a temperature below 100 degrees Fahrenheit, when tested in the closed oil tester, known as the New York State, or Elliott Oil Tester, according to the following formula, to wit: Fill the water bath with fresh well or hydrant water up to the lead mark on the inside; then immerse the oil cup in the water and pour in oil, so as to fill the cup up to within one-eighth of an inch of the flange. Take a piece of blotting paper, and remove all air bubbles from the surface of the oil by lightly touching them with the paper. Next, carefully, with a dry towel or cloth, wipe the upper inner parts of the oil cup, so as to remove any drops of oil that might have spattered on the upper part of the cup. Then put on the glass cover of the oil cup, pass the thermometer through the hole in the cork to such a point that the mercury bulb will just be covered by the surface of the oil. Next light the lamp and introduce it under the water bath. So adjust the flame that the temperature will rise at the rate of two degrees a minute. Wait until the temperature reaches ninety-nine degrees F.; then light a wooden toothpick and pass the flame through the semi-circular opening in the glass plate at such an angle as to clear glass cover and to a distance about half way between the oil and the cover. The motion should be steady and uniform, rapid and without pause. The appearance of a slight bluish flame shows that the flashing point has been reached. If the oil flashes at this point it should be branded "State



HON. CLARK HOWELL, PRESIDENT OF THE GEORGIA SENATE.

of Georgia. Rejected." If it does not flash at this point it should be branded "State of Georgia. Approved." Naphtha and illuminating products of petroleum which will not stand the flash test required by this section may be used for illuminating or heating purposes only in the following cases:

1st. In street lamps and open air receptacles, apart from any buildings, factory or inhabited houses in which the vapor is burned.

2d. In dwellings, factories or other places of business, when vaporized in secure tanks or metal generators, made for the purpose, in which the vapor so generated is used for lighting or heating.

3d. For use in the manufacture of illuminating gas in gas manufactories situated apart from dwellings and other buildings. The inspector shall provide at his own expense instruments for testing oil, and stencils for branding packages to read thus: "State of Georgia. Approved," with name of inspector and date of inspection. The inspector shall brand all oils and fluids falling below 100 degrees flash test, in the Elliott tester, "State of Georgia. Rejected," with name of inspector and date of inspection. If the inspector shall find any illuminating oil or fluid under the flash test required by law, or falsely branded, he shall cause the offender to be prosecuted.

Sec. 3. And it is hereby made the duty of such General Inspector of Oils to personally prosecute each and every offender under the provisions of this act, and upon conviction such offender shall be punished as prescribed in section 1039 of the Code of Georgia, and all fines arising from prosecution under this act shall be paid into and become a part of the general educational fund of this State.

Sec. 4. Be it further enacted, That all laws and parts of laws in conflict with this act be, and the same are, hereby repealed.

Approved December 20, 1899.

The organic law of the State is its constitution, which we here append:

CONSTITUTION OF THE STATE OF GEORGIA.

BILL OF RIGHTS.

PREAMBLE.

To perpetuate the principles of free government, insure justice to all, preserve peace, promote the interest and happiness of the citizen, and transmit to posterity the enjoyment of liberty, we, the people of Georgia, relying up the protection and guidance of Almighty God, do ordain and establish this Constitution:

ARTICLE I.

Section I.

Paragraph I. All government, of right, originates with the people, is founded upon their will only, and is instituted solely for the good

of the whole. Public officers are the trustees and servants of the people, and at all times amenable to them.

Par. II. Protection to person and property is the paramount duty of government, and shall be impartial and complete.

Par. III. No person shall be deprived of life, liberty or property, except by due process of law.

Par. IV. No person shall be deprived of the right to prosecute or defend his own cause in any of the courts of this State in person, by attorney or both.

Par. V. Every person charged with an offense against the laws of this State shall have the privilege and benefit of counsel; shall be furnished, on demand, with a copy of the accusation, and a list of the witnesses on whose testimony the charge against him is founded; shall have compulsory process to obtain the testimony of his own witnesses; shall be confronted with the witnesses testifying against him, and shall have a public and speedy trial by an impartial jury.

Par. VI. No person shall be compelled to give testimony tending in any way to criminate himself.

Par. VII. Neither banishment beyond the limits of the State, nor whipping, as a punishment for crime, shall be allowed.

Par. VIII. No person shall be put in jeopardy of life, or liberty, more than once for the same offense save on his, or her, own motion for a new trial after conviction, or in case of mistrial.

Par. IX. Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishment inflicted; nor shall any person be abused in being arrested, while under arrest or in prison.

Par. X. No person shall be compelled to pay costs, except after conviction on final trial.

Par. XI. The writ of *habeas corpus* shall not be suspended.

Par. XII. All men have the natural and inalienable right to worship God, each according to the dictates of his own conscience, and no human authority should in any case, control or interfere with such right of conscience.

Par. XIII. No inhabitant of this State shall be molested in person or property, or prohibited from holding any public office or trust, on account of his religious opinions; but the right of liberty of conscience shall not be so construed as to excuse acts of licentiousness, or justify practices inconsistent with the peace and safety of the State.

Par. XIV. No money shall ever be taken from the public treasury, directly or indirectly, in aid of any church, sect or denomination of religionists, or of any sectarian institution.

Par. XV. No law shall ever be passed to curtail, or restrain, the liberty of speech, or of the press: any person may speak, write and publish his sentiments on all subjects, being responsible for the abuse of that liberty.

Par. XVI. The right of the people to be secure in their persons, houses, papers and effects against unreasonable searches and seizures shall not be violated; and no warrant shall issue except upon probable

cause, supported by oath, or affirmation, particularly describing the place, or places, to be searched, and the person or things to be seized.

Par. XVII. There shall be within the State of Georgia neither slavery nor involuntary servitude, save as a punishment for crime after legal conviction thereof.

Par. XVIII. The social status of the citizen shall never be the subject of legislation.

Par. XIX. The civil authority shall be superior to the military, and no soldier shall, in time of peace, be quartered in any house without the consent of the owner, nor in time of war, except by the civil magistrate, in such manner as may be provided by law.

Par. XX. The power of the courts to punish for contempts shall be limited by legislative acts.

Par. XXI. There shall be no imprisonment for debt.

Par. XXII. The right of the people to keep and bear arms shall not be infringed, but the General Assembly shall have power to prescribe the manner in which arms may be borne.

Par. XXIII. The legislative, judicial and executive powers shall forever remain separate and distinct, and no person discharging the duties of one shall at the same time exercise the functions of either of the others, except as herein provided.

Par. XXIV. The people have the right to assemble peaceably for their common good, and to apply to those vested with the powers of government for redress of grievances by petition or remonstrance.

Par. XXV. All citizens of the United States, resident in this State, are hereby declared citizens of this State; and it shall be the duty of the General Assembly to enact such laws as will protect them in the full enjoyment of the rights, privileges and immunities due to such citizenship.

Section II.

Paragraph I. In all prosecutions or indictments for libel, the truth may be given in evidence; and the jury in all criminal cases shall be the judges of the law and the facts. The power of the judges to grant new trials in case of conviction is preserved.

Par. II. Treason against the State of Georgia shall consist in levying war against her, adhering to her enemies, giving them aid and comfort. No person shall be convicted of treason except on the testimony of two witnesses to the same overt act, or confession in open court.

Par. III. No conviction shall work corruption of blood, or forfeiture of estate.

Par. IV. All lotteries, and the sale of lottery tickets, are hereby prohibited; and this prohibition shall be enforced by penal laws.

Par. V. Lobbying is declared to be a crime, and the General Assembly shall enforce this provision by suitable penalties.

Par. VI. The General Assembly shall have the power to provide for the punishment of fraud; and shall provide, by law, for reaching property of the debtor concealed from the creditor.

Section III.

Paragraph I. In cases of necessity, private ways may be granted upon just compensation being first paid by the applicant. Private property shall not be taken, or damaged, for public purposes, without just and adequate compensation being first paid.

Par. II. No bill of attainder, *ex post facto* law, retroactive law or law impairing the obligation of contracts or making irrevocable grants of special privileges or immunities, shall be passed.

Par. III. No grant of special privileges or immunities shall be revoked, except in such manner as to work no injustice to the incorporators or creditors of the incorporation.

Section IV.

Paragraph 1. Laws of a general nature shall have uniform operation throughout the State, and no special law shall be enacted in any case for which provision has been made by an existing general law. No general law affecting private rights shall be varied in any particular case by special legislation, except with the free consent, in writing, of all persons affected thereby; and no person under legal disability to contract is capable of such consent.

Par. II. Legislative acts in violation of this constitution, or the constitution of the United States, are void, and the judiciary shall so declare them.

Section V.

Paragraph I. The people of this State have the inherent, sole and exclusive right of regulating their internal government, and the police thereof, and of altering and abolishing their constitution whenever it may be necessary to their safety and happiness.

Par. II. The enumeration of rights herein contained, as a part of this constitution shall not be construed to deny to the people any inherent rights which they may have hitherto enjoyed.

ARTICLE II.

ELECTIVE FRANCHISE.

Section I.

Paragraph I. In all elections by the people the electors shall vote by ballot.

Par. II. Every male citizen of the United States (except as herein-after provided), twenty-one years of age, who shall have resided in this State one year next preceding the election, and shall have resided six months in the county in which he offers to vote, and shall have paid all taxes which may hereafter be required of him, and which he may



HON. JOHN D. LITTLE,
Speaker of the House of Representatives.

have had an opportunity of paying, agreeable to law, except for the year of the election, shall be deemed an elector; *provided*, that no soldier, sailor or marine in the military or naval service of the United States shall acquire the rights of an elector by reason of being stationed on duty in this State; and no person shall vote who, if challenged, shall refuse to take the following oath or affirmation: "I do swear (or affirm) that I am twenty-one years of age, have resided in this State one year and in this county six months, next preceding this election. I have paid all taxes which, since the adoption of the present constitution of this State, have been required of me previous to this year, and which I have had an opportunity to pay, and I have not voted at this election."

Section II.

Paragraph I. The General Assembly may provide, from time to time, for the registration for all electors, but the following classes of persons shall not be permitted to register, vote or hold any office, or appointment of honor or trust in this State, to wit: 1st. Those who shall have been convicted, in any court of competent jurisdiction, of treason against the State, or embezzlement of public funds, malefeasance in office, bribery or larceny, or of any crime involving moral turpitude, punishable by laws of this State with imprisonment in the penitentiary, unless such person shall have been pardoned. 2d. Idiots and insane persons.

Section III.

Paragraph I. Electors shall, in all cases except for treason, felony, larceny and breach of the peace, be privileged from arrest during their attendance on elections, and in going to and returning from the same.

Section IV.

Paragraph I. No person who is the holder of any public money, contrary to law, shall be eligible to any office in this State until the same is accounted for and paid into the treasury.

Par. II. No person who, after the adoption of this constitution, being a resident of this State, shall have been convicted of fighting a duel in this State, or convicted of sending or accepting a challenge, or convicted of aiding or abetting such duel, shall hold office in this State, unless he shall have been pardoned; and every such person shall also be subject to such punishment as may be prescribed by law.

Section V.

Paragraph I. The General Assembly shall, by law, forbid the sale, distribution or furnishing of intoxicating drinks within two miles of election precincts on days of election—State, county or municipal—and prescribe punishment for any violation of the same.

Section VI.

Paragraph I. Returns of elections for all civil officers elected by the people, who are to be commissioned by the Governor, and also for the members of the General Assembly, shall be made to the Secretary of State, unless otherwise provided by law.

ARTICLE III.

LEGISLATIVE DEPARTMENT.

Section I.

Paragraph I. The legislative power of the State shall be vested in a General Assembly, which shall consist of a Senate and House of Representatives.

Section II.

Paragraph I. The Senate shall consist of forty-four members. There shall be forty-four Senatorial districts as now arranged by counties. Each district shall have one Senator.

The First Senatorial District shall be composed of the counties of Chatham, Bryan and Effingham.

The Second Senatorial District shall be composed of the counties of Liberty, Tattnall and McIntosh.

The Third Senatorial District shall be composed of the counties of Wayne, Pierce and Appling.

The Fourth Senatorial District shall be composed of the counties of Glynn, Camden and Charlton.

The Fifth Senatorial District shall be composed of the counties of Coffee, Ware and Clinch.

The Sixth Senatorial District shall be composed of the counties of Echols, Lowndes and Berrien.

The Seventh Senatorial District shall be composed of the counties of Brooks, Thomas and Colquitt.

The Eighth Senatorial District shall be composed of the counties of Decatur, Mitchell and Miller.

The Ninth Senatorial District shall be composed of the counties of Early, Calhoun and Baker.

The Tenth Senatorial District shall be composed of the counties of Dougherty, Lee and Worth.

The Eleventh Senatorial District shall be composed of the counties of Clay, Randolph and Terrell.

The Twelfth Senatorial District shall be composed of the counties of Stewart, Webster and Quitman.

The Thirteenth Senatorial District shall be composed of the counties of Sumter, Schley and Macon.

The Fourteenth Senatorial District shall be composed of the counties of Dooley, Wilcox, Pulaski and Dodge.

The Fifteenth Senatorial District shall be composed of the counties of Montgomery, Telfair and Irwin.

The Sixteenth Senatorial District shall be composed of the counties of Laurens, Emanuel and Johnson.

The Seventeenth Senatorial District shall be composed of the counties of Screven, Bulloch and Burke.

The Eighteenth Senatorial District shall be composed of the counties of Richmond, Glascock and Jefferson.

The Nineteenth Senatorial District shall be composed of the counties of Taliaferro, Greene and Warren.

The Twentieth Senatorial District shall be composed of the counties of Baldwin, Hancock and Washington.

The Twenty-first Senatorial District shall be composed of the counties of Twiggs, Wilkinson and Jones.

The Twenty-second Senatorial District shall be composed of the counties of Bibb, Monroe and Pike.

The Twenty-third Senatorial District shall be composed of the counties of Houston, Crawford and Taylor.

The Twenty-fourth Senatorial District shall be composed of the counties of Muscogee, Marion and Chattahoochee.

The Twenty-fifth Senatorial District shall be composed of the counties of Harris, Upson and Talbot.

The Twenty-six Senatorial District shall be composed of the counties of Spalding, Butts and Fayette.

The Twenty-seventh Senatorial District shall be composed of the counties of Newton, Walton, Clarke, Oconee and Rockdale.

The Twenty-eighth Senatorial District shall be composed of the counties of Jasper, Putnam and Morgan.

The Twenty-ninth Senatorial District shall be composed of the counties of Wilkes, Columbia, Lincoln and McDuffie.

The Thirtieth Senatorial District shall be composed of the counties of Oglethorpe, Madison and Elbert.

The Thirty-first Senatorial District shall be composed of the counties of Hart, Habersham and Franklin.

The Thirty-second Senatorial District shall be composed of the counties of White, Dawson and Lumpkin.

The Thirty-third Senatorial District shall be composed of the counties of Hall, Banks and Jackson.

The Thirty-fourth Senatorial District shall be composed of the counties of Gwinnett, DeKalb and Henry.

The Thirty-fifth Senatorial District shall be composed of the counties of Clayton, Cobb and Fulton.

The Thirty-sixth Senatorial District shall be composed of the counties of Campbell, Coweta, Meriwether and Douglas.

The Thirty-seventh Senatorial District shall be composed of the counties of Carroll, Heard and Troup.

The Thirty-eighth Senatorial District shall be composed of the counties of Haralson, Polk and Paulding.

The Thirty-ninth Senatorial District shall be composed of the counties of Milton, Cherokee and Forsyth.

The Fortieth Senatorial District shall be composed of the counties of Union, Towns and Rabun.

The Forty-first Senatorial District shall be composed of the counties of Pickens, Fannin and Gilmer.

The Forty-second Senatorial District shall be composed of the counties of Bartow, Floyd and Chattooga.

The Forty-third Senatorial District shall be composed of the counties of Murray, Gordon and Whitfield.

The Forty-fourth Senatorial District shall be composed of the counties of Walker, Dade and Catoosa.

Par. III. The General Assembly may change these districts after each census of the United States; *provided*, that neither the number of districts nor the number of Senators from each district shall be increased.

Section III.

Paragraph I. The House of Representatives shall consist of one hundred and seventy-five Representatives, apportioned among the several counties as follows, to wit: To the six counties having the largest population, viz.: Chatham, Richmond, Burke, Floyd, Bibb and Fulton, three Representatives each; to the twenty-six counties having the next largest population, viz.: Dooly, Bartow, Coweta, Decatur, Houston, Greene, Gwinnett, Harris, Jefferson, Meriwether, Monroe, Muscogee, Pulaski, DeKalb, Hall, Walton, Sumter, Thomas, Troup, Washington, Hancock, Carroll, Cobb, Jackson, Oglethorpe and Wilkes, two Representatives each; and to the remaining one hundred and five counties one Representative each.

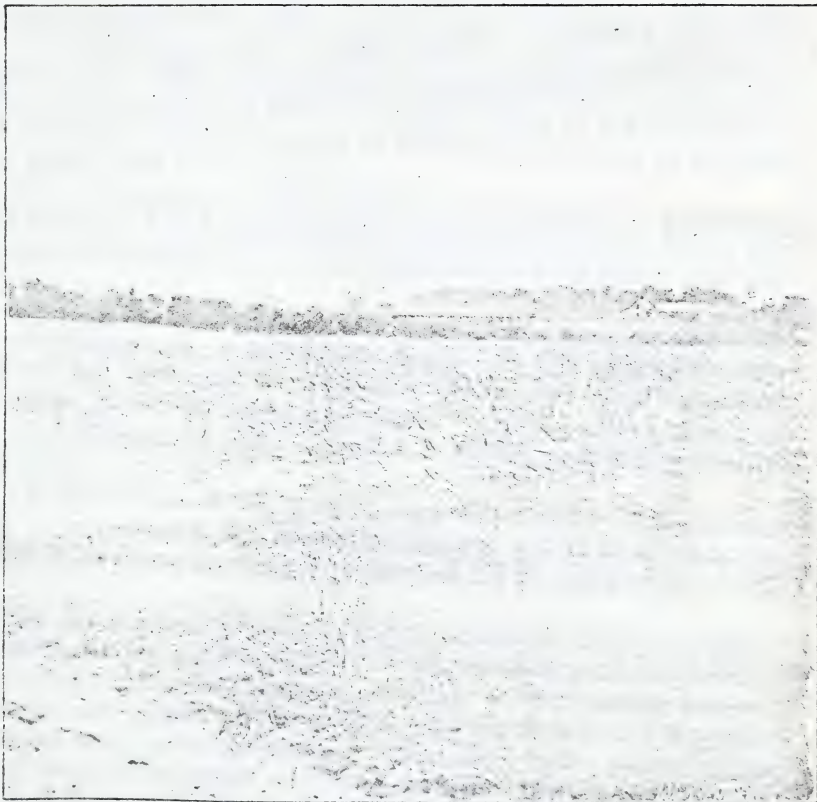
Par. II. The above apportionment shall be changed by the General Assembly at its first session after each census taken by the United States Government, so as to give the six counties having the largest population three Representatives each; and to the twenty-six counties having the next largest population two Representatives each; but in no event shall the aggregate number of Representatives be increased.*

* According to the provision of this paragraph the apportionment by the new census will be as follows:

Fulton, Chatham, Richmond, Bibb, Floyd, Thomas, three representatives each.
Burke, Muscogee, Decatur, Washington, Carroll, Dooly, Sumter, Laurens, Gwinnett, Coweta, Cobb, Jackson, Troup, Meriwether, Houston, Bulloch, Emanuel, DeKalb, Walton, Wilkes, Bartow, Hall, Monroe, Tattnall, Lowndes, Liberty, two representatives each.

The remaining one hundred and five counties, one representative.

The counties are here arranged in the order of population.



GEORGIA WHEATFIELD.

Section IV.

Paragraph I. The members of the General Assembly shall be elected for two years, and shall serve until their successors are elected.

Par. II. The first election for members of the General Assembly, under this constitution, shall take place on the first Wednesday in December, 1877; the second election for the same shall be held on the first Wednesday in October, 1880, and subsequent elections biennially on that day, until the day of election is changed by law.

Par. III. The first meeting of the General Assembly, after the ratification of this constitution, shall be on the fourth Wednesday in October, 1878, and annually thereafter, on the same day, until the day shall be changed by law. But nothing herein contained shall be construed to prevent the Governor from calling an extra session of the General Assembly before the first Wednesday in November, 1878, if, in his opinion, the public good shall require it.

Par. IV. A majority of each House shall constitute a quorum to transact business; but a smaller number may adjourn from day to day and compel the presence of its absent members, as each House may provide.

Par. V. Each Senator and Representative, before taking his seat, shall take the following oath, or affirmation, to wit: "I will support the constitution of this State, and of the United States; and on all questions and measures which may come before me, I will so conduct myself as will, in my judgment, be most conducive to the interests and prosperity of this State."

Par. VI. No session of the General Assembly shall continue longer than fifty days; *provided*, that if an impeachment trial be pending at the end of fifty days, the session may be prolonged till the completion of said trial.

Par. VII. No person holding a military commission or other appointment or office, having any emolument or compensation annexed thereto, under this State, or the United States, or either of them, except justices of the peace and officers of the militia, nor any defaulter for public money, or for any legal taxes required of him, shall have a seat in either House; nor shall any Senator or Representative, after his qualification as such, be elected by the General Assembly, or appointed by the Governor, either with or without the advice and consent of the Senate, to any office or appointment having any emolument annexed thereto, during the time for which he shall have been elected.

Par. VIII. The seat of a member of either House shall be vacated on his removal from the district or county from which he was elected.

Section V.

Paragraph I. The Senators shall be citizens of the United States, who have attained the age of twenty-five years, and who shall have been citizens of this State for four years, and for one year residents of the district from which elected.

Par. II. The presiding officer of the Senate shall be styled the President of the Senate, and shall be elected *viva voce* from the Senators.

Par. III. The Senate shall have the sole power to try impeachments.

Par. IV. When sitting for that purpose, the members shall be on oath or affirmation, and shall be presided over by the Chief Justice or the presiding Justice of the Supreme Court. Should the Chief Justice be disqualified, the Senate shall elect the Judge of the Supreme Court to preside. No person shall be convicted without the concurrence of two-thirds of the members present.

Par. V. Judgments, in case of impeachment, shall not extend further than removal from office and disqualification to hold and enjoy any office of honor, trust or profit, within this State; but the party shall, nevertheless, be liable and subject to indictment, trial, judgment and punishment according to law.

Section VI.

Paragraph I. The Representatives shall be citizens of the United States, who have attained the age of twenty-one years, and who shall have been citizens of this State for two years, and for one year residents of the counties from which elected.

Par. II. The presiding officer of the House of Representatives shall be styled the Speaker of the House of Representatives, and shall be elected *viva voce* from the body.

Par. III. The House of Representatives shall have the sole power to impeach all persons who shall have been, or may be, in office.

Section VII.

Paragraph I. Each House shall be the judge of the election, returns and qualifications of its members, and shall have power to punish them for disorderly behavior, or misconduct, by censure, fine, imprisonment, or expulsion; but no member shall be expelled, except by a vote of two-thirds of the House to which he belongs.

Par. II. Each House may punish by imprisonment, not extending beyond the session, any person, not a member, who shall be guilty of a contempt, by any disorderly behavior in its presence, or who shall rescue, or attempt to rescue, any person arrested by order of either House.

Par. III. The members of both Houses shall be free from arrest during their attendance on the General Assembly and in going thereto or returning therefrom, except for treason, felony, larceny, or breach of the peace; and no member shall be liable to answer in any other place for anything spoken in debate in either House.

Par. IV. Each House shall keep a journal of its proceedings, and publish it immediately after its adjournment.

Par. V. The original journal shall be preserved, after publication, in the office of Secretary of State, but there shall be no other record thereof.

Par. VI. The yeas and nays on any question shall, at the desire of one-fifth of the members present, be entered on the journal.

Par. VII. Every bill, before it shall pass, shall be read three times, and on three separate days, in each House, unless in case of actual invasion or insurrection. But the first and second reading of each local bill and bank and railroad charters in each House shall consist of the reading of the title only, unless said bill is ordered to be engrossed.

Par. VIII. No law or ordinance shall pass which refers to more than one subject-matter, or contains matter different from what is expressed in the title thereof.

Par. IX. The general appropriation bill shall embrace nothing except appropriations fixed by previous laws, the ordinary expenses of the Executive, Legislative and Judicial Departments of the Government, payment of the public debt and interest thereon, and the support of the public institutions and educational interests of the State. All other appropriations shall be made by separate bills, each embracing but one subject.

Par. X. All bills for raising revenue or appropriating money shall originate in the House of Representatives, but the Senate may propose or concur in amendments as in other bills.

Par. XI. No money shall be drawn from the treasury except by appropriation made by law, and a regular statement and account of the receipt and expenditure of all public money shall be published every three months, and also with the laws passed by each session of the General Assembly.

Par. XII. No bill or resolution appropriating money shall become a law, unless, upon its passage, the yeas and nays, in each House, are recorded.

Par. XIII. All acts shall be signed by the President of the Senate and the Speaker of the House of Representatives, and no bill, ordinance or resolution, intended to have the effect of law, which shall have been rejected by either House, shall be again proposed during the same session, under the same or any other title, without the consent of two-thirds of the House by which the same was rejected.

Par. XIV. No bill shall become a law unless it shall receive a majority of the votes of all the members elected to each House of the General Assembly, and it shall, in every instance, so appear on the journal.

Par. XV. (By an act approved September 24, 1885, an amendment to the constitution was submitted to vote of the people in October, 1886, and adopted, whereby the original of this paragraph was stricken from this constitution.)

Par. XVI. No local or special bill shall be passed, unless notice of the intention to apply therefor shall have been published in the locality where the matter, or thing to be affected, may be situated, which notice shall be given at least thirty days prior to the introduction of such bill into the General Assembly and in the manner to be prescribed by law. The evidence of such notice having been published shall be exhibited in the General Assembly before such act shall be passed.

Par. XVII. No law, or section of the Code, shall be amended or repealed by mere reference to its title, or to the number of the section of the Code, but the amending or repealing act shall distinctly describe the law to be amended or repealed, as well as the alteration to be made.

Par. XVIII. The General Assembly shall have no power to grant corporate powers and privileges to private companies; nor to make or change election precincts; nor to establish bridges or ferries; nor to change names of legitimate children; but it shall prescribe by law the manner in which such powers shall be exercised by the courts. All corporate powers and privileges to banking, insurance, railroad, canal, navigation, express and telegraph companies shall be issued and granted by the Secretary of State, in such manner as shall be prescribed by law.

Par. XIX. The General Assembly shall have no power to relieve principals or securities upon forfeited recognizances, from the payment thereof, either before or after judgment thereon, unless the principal in the recognizance shall have been apprehended and placed in the custody of the proper officer.

Par. XX. The General Assembly shall not authorize the construction of any street passenger railway within the limits of any incorporated town or city without the consent of the corporate authorities.

Par. XXI. Whenever the constitution requires a vote of two-thirds of either or both Houses for the passage of an act or resolution, the yeas and nays on the passage thereof shall be entered on the journal.

Par. XXII. The General Assembly shall have power to make all laws and ordinances consistent with this constitution, and not repugnant to the constitution of the United States, which they shall deem necessary and proper for the welfare of the State.

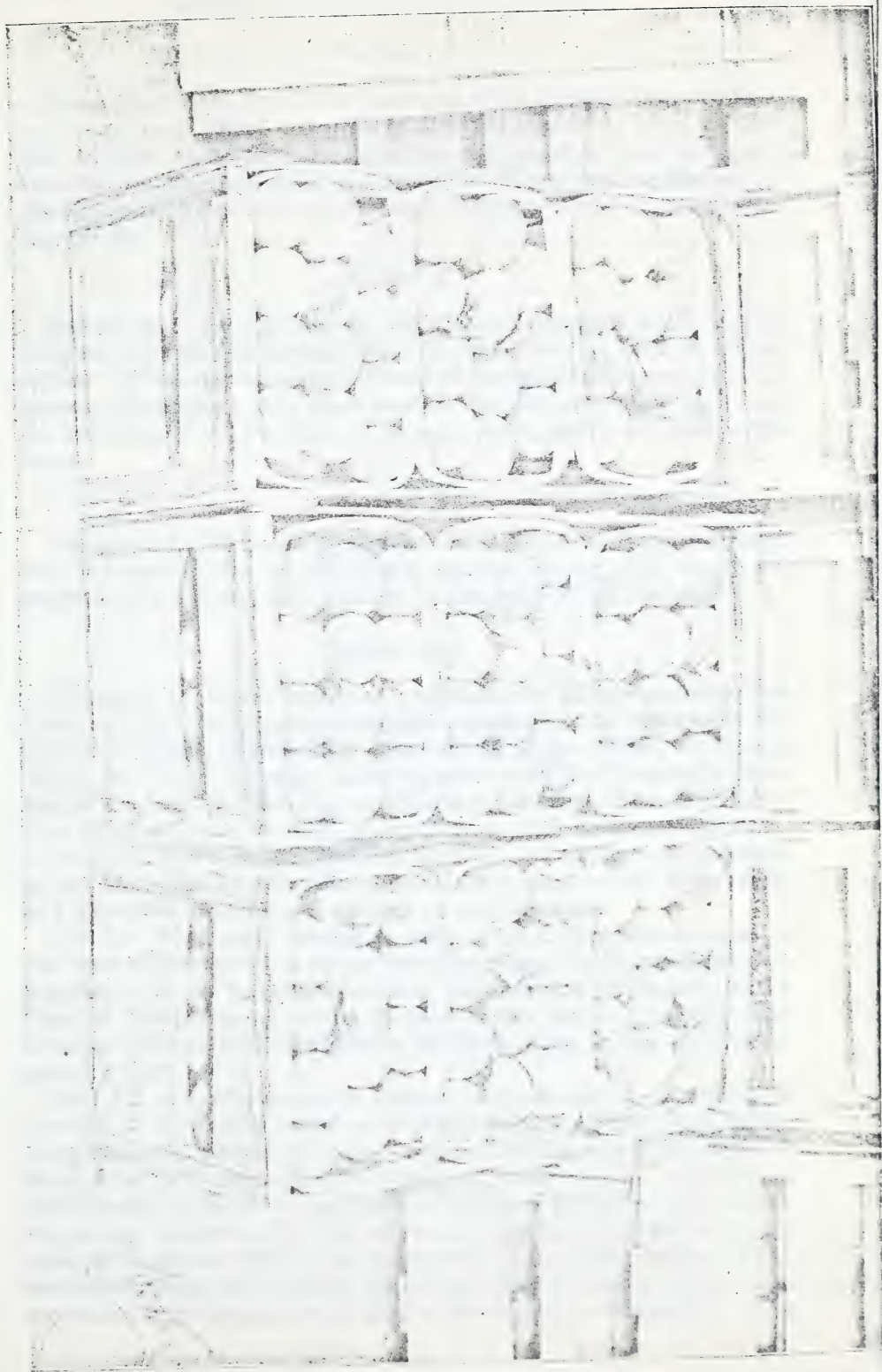
Par. XXIII. No provision in this constitution, for a two-thirds' vote of both Houses of the General Assembly, shall be construed to waive the necessity for the signature of the Governor, as in any other case, except in the case of the two-thirds' vote required to override the veto, and in case of prolongation of a session of the General Assembly.

Par. XXIV. Neither House shall adjourn for more than three days, or to any other place, without the consent of the other; and in case of a disagreement between the two Houses on a question of adjournment, the Governor may adjourn either or both of them.

Section VIII.

Paragraph I. The officers of the two Houses, other than the President and Speaker, shall be a Secretary of the Senate and Clerk of the House of Representatives, and such assistants as they may appoint; but the clerical expenses of the Senate shall not exceed sixty dollars per day for each session, nor those of the House of Representatives seventy dollars per day for each session. The Secretary of the Senate and Clerk of the House of Representatives shall be required to give bond and security for the faithful discharge of their respective duties.

PACKED PEACHES.



Section IX.

Paragraph I. The *per diem* of members of the General Assembly shall not exceed four dollars, and mileage shall not exceed ten cents for each mile traveled, by the nearest practicable route in going to and returning from the Capital; but the President of the Senate and the Speaker of the House of Representatives shall each receive not exceeding seven dollars per day.

Section X.

Paragraph I. All elections by the General Assembly shall be *viva voce*, and the vote shall appear on the journal of the House of Representatives. When the Senate and House of Representatives unite for the purpose of elections, they shall meet in the Representative Hall, and the President of the Senate shall, in such cases, preside and declare the result.

Section XI.

Paragraph I. All property of the wife at the time of her marriage, and all property given to, inherited or acquired by her, shall remain her separate property, and not be liable for the debts of her husband.

Section XII.

Paragraph I. All life insurance companies now doing business in this State, or which may desire to establish agencies and do business in the State of Georgia, chartered by other States of the Union, or foreign States, shall show that they have deposited with the Comptroller-General of the State in which they are chartered or of this State, the Insurance Commissioners, or such other officer as may be authorized to receive it, not less than one hundred thousand dollars, in such securities as may be deemed by such officer equivalent to cash, subject to his order, as a guarantee fund for the security of policy-holders.

Par. II. When such showing is made to the Comptroller-General of the State of Georgia by a proper certificate from the State official having charge of the funds so deposited, the Comptroller-General of the State of Georgia is authorized to issue to the company making such showing a license to do business in the State, upon paying the fees required by law.

Par. III. All life insurance companies chartered by the State of Georgia, or which may hereafter be chartered by the State, shall, before doing business, deposit with the Comptroller-General of the State of Georgia, or with some strong corporation, which may be approved by said Comptroller-General, one hundred thousand dollars, in such securities as may be deemed by him equivalent to cash, to be subject to his order, as a guarantee fund for the security of the policy-holders of the company making such deposit, all interests and dividends arising from such securities to be paid, when due, to the company so depositing. Any

such securities as may be needed or desired by the company may be taken from said department at any time by replacing them with other securities equally acceptable to the Comptroller-General, whose certificate for the same shall be furnished to the company.

Par. IV. The General Assembly shall, from time to time enact laws to compel all fire insurance companies doing business in this State, whether chartered by this State or otherwise, to deposit reasonable securities with the Treasurer of this State, to secure the people against loss by the operations of said companies.

Par. V. The General Assembly shall compel all insurance companies in this State, or doing business therein, under proper penalties, to make semi-annual reports to the Governor, and print the same, at their own expense, for the information and protection of the people.

ARTICLE IV.

POWER OF THE GENERAL ASSEMBLY OVER TAXATION.

Section I.

Paragraph I. The right of taxation is a sovereign right, inalienable, indestructible, is the life of the State, and rightfully belongs to the people in all Republican governments, and neither the General Assembly, nor any, nor all other departments of the Government established by this constitution, shall ever have the authority to irrevocably give, grant, limit or restrain this right; and all laws, grants, contracts and all other acts whatsoever, by said Government, or any department thereof, to effect any of these purposes, shall be, and are hereby, declared to be null and void for every purpose whatsoever; and said right of taxation shall always be under the complete control of, and revocable by the State, notwithstanding any gift, grant or contract whatsoever by the General Assembly.

Section II.

Paragraph I. The power and authority regulating railroad freights and passenger tariffs, preventing unjust discriminations, and requiring reasonable and just rates of freight and passenger tariffs, are hereby conferred upon the General Assembly, whose duty it shall be to pass laws, from time to time, to regulate freight and passenger tariffs, to prohibit unjust discriminations on the various railroads of this State, and to prohibit said roads from charging other than just and reasonable rates, and enforce the same by adequate penalties.

Par. II. The exercise of the right of eminent domain shall never be abridged, nor so construed as to prevent the General Assembly from taking the property and franchises of incorporated companies, and subjecting them to public use, the same as property of individuals: and the exercise of the police power of the State shall never be abridged, nor so

construed as to permit corporations to conduct their business in such a manner as to infringe the equal rights of individuals, or the general well-being of the State.

Par. III. The General Assembly shall not remit the forfeiture of the charter of any corporation now existing, nor alter or amend the same, nor pass any other general or special law for the benefit of said corporation, except upon the condition that said corporation shall thereafter hold its charter subject to the provisions of this constitution; and every amendment of any charter of any corporation in this State, or any special law for its benefit, accepted thereby, shall operate as a novation of said charter, and shall bring the same under the provisions of this constitution; *provided*, that this section shall not extend to any amendment for the purpose of allowing any existing road to take stock in, or aid in the building of any branch road.

Par. IV. The General Assembly of this State shall have no power to authorize any corporation to buy shares, or stock, in any other corporation in this State, or elsewhere, or to make any contract or agreement whatever, with any such corporation, which may have the effect, or be intended to have the effect, to defeat or lessen competition in their respective business, or to encourage monopoly; and all such contracts and agreements shall be illegal and void.

Par. V. No railroad company shall give, or pay, any rebate, or *bonus* in the nature thereof, directly or indirectly, or do any act to mislead or deceive the public as to the real rates charged or received for freights or passage; and any such payments shall be illegal and void, and these prohibitions shall be enforced by suitable penalties.

Par. VI. No provision of this article shall be deemed, held or taken to impair the obligation of any contract heretofore made by the State of Georgia.

Par. VII. The General Assembly shall enforce the provisions of this article by appropriate legislation.

ARTICLE V.

EXECUTIVE DEPARTMENT.

Section I.

Paragraph I. The officers of the Executive Department shall consist of a Governor, Secretary of State, Comptroller-General and Treasurer.

Par. II. The executive power shall be vested in a Governor, who shall hold his office during the term of two years, and until his successor shall be chosen and qualified. He shall not be eligible to re-election, after the expiration of a second term, for the period of four years. He shall have a salary of three thousand dollars per annum (until otherwise provided by a law passed by a two-thirds vote of both branches of the General Assembly), which shall not be increased or diminished during the period for which he shall have been elected; nor shall he receive within

that time, any other emolument from the United States, or either of them, or from any foreign power. But this reduction of salary shall not apply to the present term of the present Governor.

Par. III. The first election for Governor, under this constitution, shall be held on the first Wednesday in October, 1880, and the Governor-elect shall be installed in office at the next session of the General Assembly. An election shall take place biennially thereafter on said day, until another date be fixed by the General Assembly. Said election shall be held at the places of holding general elections in the several counties of this State, in the manner prescribed for the election of members of the General Assembly, and the electors shall be the same.

Par. IV. The returns for every election of Governor shall be sealed up by the managers, separately from other returns, and directed to the President of the Senate and Speaker of the House of Representatives, and transmitted to the Secretary of State, who shall, without opening said returns, cause the same to be laid before the Senate on the day after the two Houses shall have been organized, and they shall be transmitted by the Senate to the House of Representatives.

Par. V. The members of each branch of the General Assembly shall convene in the Representative Hall, and the President of the Senate and Speaker of the House of Representatives shall open and publish the returns in the presence and under the direction of the General Assembly; and the person having the majority of the whole number of votes shall be declared duly elected Governor of this State; but if no person shall have such majority, then from the two persons having the highest number of votes, who shall be in life, and shall not decline an election at the time appointed by the General Assembly to elect, the General Assembly shall immediately elect a Governor *viva voce*; and in all cases of election of a Governor by the General Assembly a majority of the members present shall be necessary to a choice.

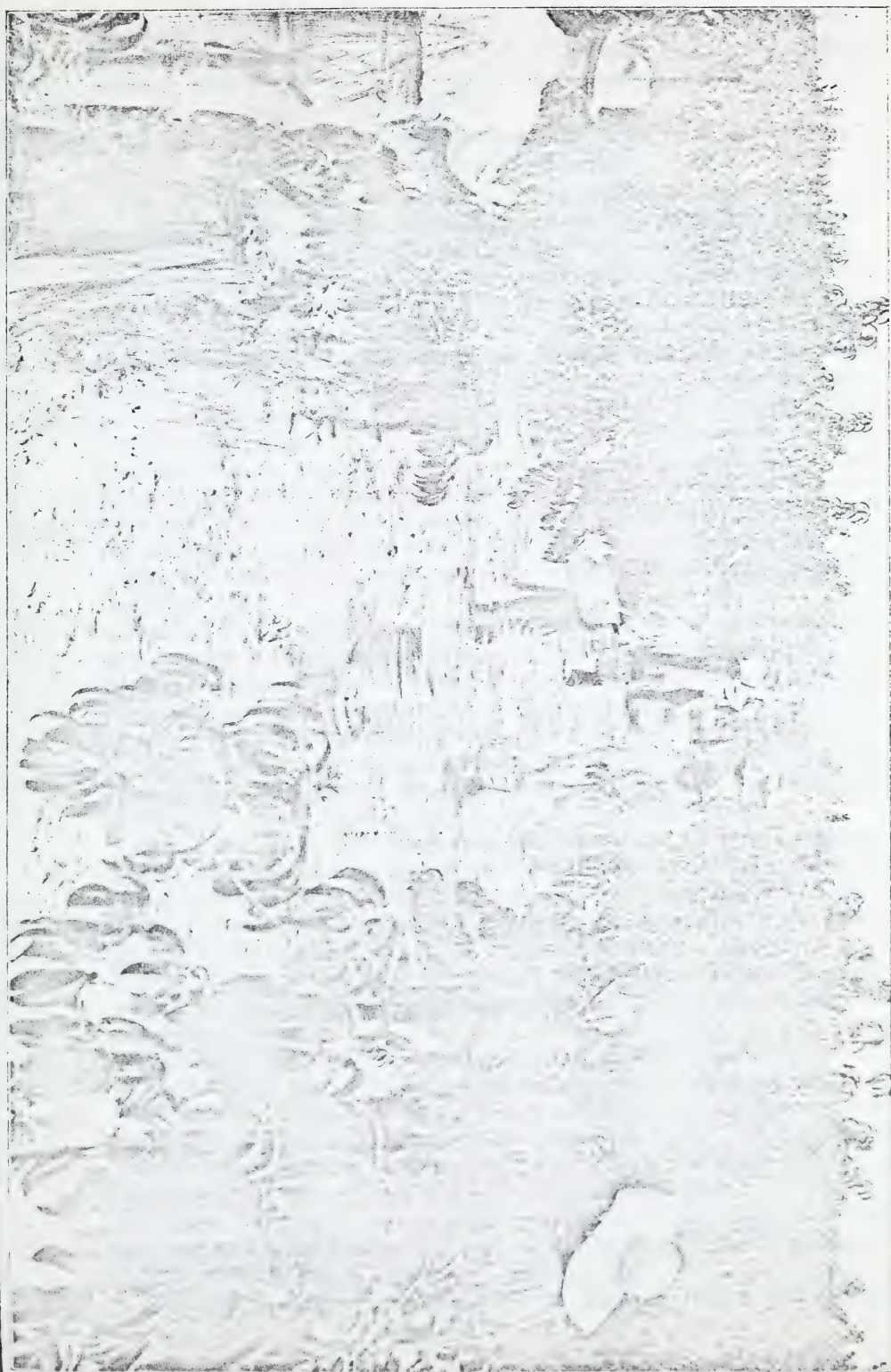
Par. VI. Contested elections shall be determined by both Houses of the General Assembly in such manner as shall be prescribed by law.

Par. VII. No person shall be eligible to the office of Governor who shall not have been a citizen of the United States fifteen years, and a citizen of the State six years, and who shall not have attained the age of thirty years.

Par. VIII. In case of the death, resignation or disability of the Governor, the President of the Senate shall exercise the executive powers of the government until such disability be removed, or a successor is elected and qualified. And in case of the death, resignation or disability of the President of the Senate, the Speaker of the House of Representatives shall exercise the executive powers of the government until the removal of the disability, or the election and qualification of a Governor.

Par. IX. The General Assembly shall have power to provide by law for filling unexpired terms by special elections.

Par. X. The Governor shall, before he enters on the duties of his office, take the following oath or affirmation: "I do solemnly swear



(or affirm, as the case may be), that I will faithfully execute the office of Governor of the State of Georgia, and will, to the best of my ability, preserve, protect and defend the constitution thereof, and the constitution of the United States of America."

Par. XI. The Governor shall be Commander-in-Chief of the army and navy of this State, and of the militia thereof.

Par. XII. He shall have power to grant reprieves and pardons, to commute penalties, remove disabilities imposed by law, and to remit any part of a sentence for offences against the State, after conviction, except in cases of treason and impeachment, subject to such regulations as may be provided by law relative to the manner of applying for pardons. Upon conviction for treason he may suspend the execution of the sentence and report the case to the General Assembly at the next meeting thereof, when the General Assembly shall either pardon, commute the sentence, direct its execution or grant a further reprieve. He shall, at each session of the General Assembly, communicate to that body each case of reprieve, pardon or commutation granted, stating the name of the convict, the offence for which he was convicted, the sentence and its date, the date of the reprieve, pardon or commutation, and the reasons for granting the same. He shall take care that the laws are faithfully executed, and shall be a conservator of the peace throughout the State.

Par. XIII. He shall issue writs of election to fill all vacancies that may happen in the Senate or House of Representatives, and shall give the General Assembly, from time to time, information of the state of the commonwealth, and recommend to their consideration such measures as he may deem necessary or expedient. He shall have power to convoke the General Assembly on extraordinary occasions, but no law shall be enacted at call sessions of the General Assembly except such as shall relate to the object stated in his proclamation convening them.

Par. XIV. When any office shall become vacant, by death, resignation or otherwise, the Governor shall have power to fill such vacancy, unless otherwise provided by law; and persons so appointed shall continue in office until a successor is commissioned, agreeably to the mode pointed out in the constitution, or by law in pursuance thereof.

Par. XV. A person once rejected by the Senate shall not be reappointed by the Governor to the same office during the same session or the recess thereafter.

Par. XVI. The Governor shall have the revision of all bills passed by the General Assembly, before the same shall become laws, but two-thirds of each House may pass a law, notwithstanding his dissent; and if any bill shall not be returned by the Governor within five days (Sundays excepted) after it has been presented to him, the same shall be a law, unless the General Assembly, by their adjournment, shall prevent its return. He may approve any appropriation, and disapprove any other appropriation, in the same bill, and the latter shall not be effectual, unless passed by two-thirds of each House.

Par. XVII. Every vote, resolution or order, to which the concur-

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